THE ARCHITECTURE OF GREECE & ROME

WILLIAM J. ANDERSON
& R. PHENÉ SPIERS

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THE ARCHITECTURE OF THE RENAISSANCE IN ITALY.

A GENERAL VIEW FOR THE USE OF STUDENTS AND OTHERS.

By WILLIAM J. ANDERSON, A.R.I.B.A.,
Author of "Architectural Studies in Italy."

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1. RESTORATION OF THE SANCTUARY AT ELEUSIS.

By J. P. Deering (Gandy), R.A.

THE ARCHITECTURE OF GREECE & ROME

A SKETCH OF ITS HISTORIC DEVELOPMENT

BY

WILLIAM J. ANDERSON, A.R.I.B.A.

AUTHOR OF "THE ARCHITECTURE OF THE RENAISSANCE IN ITALY"

AND

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SECOND EDITION, REVISED AND ENLARGED
BY R. PHENÉ SPIERS

WITH TWO HUNDRED AND FIFTY-FIVE ILLUSTRATIONS

UNIVERSITY COLLEGE,
NOTTINGHAM.

LONDON
B. T. BATSFORD 94 HIGH HOLBORN
1907

BRADBURY, AGNEW, & CO. LD., PRINTERS,
LONDON AND TONBRIDGE.

UNIVERSITY COLLEGE,

PREFACE TO SECOND EDITION.

In the preparation of this edition the whole of the text has been carefully revised and corrected; some portions have been re-written, and various additions have been made, among which the following are the more important:—A description of the Palace at Cnossus in Crete; a revised account of the Tomb of Agamemnon at Mycenae, together with new illustrations of the same, including those of the columns, which, through the munificence of the Marquis of Sligo, have been set up in the British Museum; a series of plans of all the important Greek temples, including a general plan of those at Selinus; plans of some of the Roman temples, amongst which is one of those in the acropolis at Baalbec, hitherto unpublished; and various other details: the additional illustrations, including those already mentioned, amounting to eighty in number. To these have been added lists of the principal historical events coeval with the periods dealt with in the book, which precede the chapters on Greek and Roman architecture respectively; a chronological list of the best known Greek temples, with their approximate dates, dimensions, and other details; two specially prepared maps, one of Greece and Asia Minor, and the other of Italy, on which is indicated the position of all the principal cities referred to in the work; many additions also have been made to the Bibliography, bringing it up to date.

The author desires to take this opportunity of expressing his obligations to Mr. Frank T. Baggallay and Mr. Hugh Stannus, who rendered him the most valuable advice when he was

commencing his revision; to his brother, Mr. Walter L. Spiers, the curator of the Soane Museum, who has revised all the proofs; to Mr. Alan Potter for permission to reproduce four of his Roman photographs; to Mr. F. R. Taylor for two photographs specially taken for the work; to Mr. W. H. Smith (of Mr. Batsford's), who, besides making some valuable suggestions, has seen the work through the press and prepared the new Index; and, lastly, to his publisher, who has spared no pains or expense in the production of the work.

R. PHENÉ SPIERS.

London,
October, 1907.

PREFACE TO FIRST EDITION.

To the late William J. Anderson, of Glasgow, is due the conception of this work. The course of lectures which, on the invitation of the Governors of the School of Art in that city, he delivered in 1893–94 on the Architecture of the Renaissance in Italy (published in 1896), was followed in 1896–97 by a course on the History and Development of Greek Architecture. To this subject he devoted his studies for three years, repeating his course with various revisions, and adding to it in 1897 three additional lectures on Roman Architecture, which, with those on Greek, he intended to publish as his second work. Immediately following these Roman lectures, he continued, in 1898, with a course which included the various styles down to the present day, and in the winter of 1898–99 a further special course dealing with the Renaissance in France.

The preparation of these courses would seem to have interfered with the studies he intended to devote to Roman Architecture in order to bring them in line with the Greek. There is no doubt that he had attained a masterly grasp of the principles underlying Greek work, more particularly those dealing with the Archaic and culminating periods, the study of which would seem to have had a special attraction for him. It was his intention to deal with Roman work in the same way, and with that in view, and being in indifferent health, he expressed the desire that I, who had been in frequent communication with him respecting the various courses he had delivered, should undertake to read and see through the press the chapters on Greek Architecture (for which, as well as for the Roman, numerous illustrations had already been prepared), so as to give him more time to devote to those on Roman Architecture. He died,

however, before this intention was realised, and the whole work was then placed in my hands by Mr. Batsford with the entire concurrence of Mr. Anderson's widow.

With some slight modifications in their order, and some condensation in Chapter IV., the first four chapters are Mr. Anderson's work, as are also some passages in the others; but for the descriptions of the monuments in the fifth, sixth, and seventh chapters on Greek Architecture, for the Etruscan, and for the whole of the Roman Architecture, I am entirely responsible.

The seven lectures on Greek Architecture which Mr. Anderson delivered in 1897 had been condensed by him into five, so as to include Roman in his course, and the fifth lecture and those on Etruscan and Roman were only in the form of notes sufficient for the purpose of his lecture, but impossible for me to follow.

As the chronological sequence which Mr. Anderson had adopted in his description of Greek work could not be adhered to in dealing with Roman, owing to the immense diversity of buildings which had to be described, it was decided to class them according to their destination or purpose.

An endeavour has been made in the chapters on Roman Architecture to point out some of the principles which guided the Roman architect in the setting-out of his plan—principles which form the basis of the studies in the École des Beaux Arts in Paris, and have been handed down from generation to generation since the foundation of the School by Colbert, the minister of Louis XIV., towards the close of the seventeenth century. The shortcomings in this attempt, by no means an easy task, have, it is hoped, been partially met by the publication of some of the plans worked out by the French students in the Villa Medicis in Rome, and although these, in some cases, may not archæologically be always quite reliable, they follow the principles of design in the setting-out of the plan to which we have referred, and may enable the student to grasp these principles better than he could have done from the descriptions alone.

In parts of the work there are some theories put forward which have not yet obtained universal acceptance; but one of the objects has been to stimulate the student's interest in the subject, with the hope that, by independent research, he may ascertain for himself, either among the treasures of the British and other Museums, or in the numerous publications cited in the Bibliography, how far those theories can be substantiated.

In dealing with the nomenclature which should be adopted, more particularly with the chapters on Greek Architecture, some difficulty has been experienced in deciding whether the Greek or Roman name should be attached to either the temple or monument described. As a rule, the name by which the deity, temple, or monument is best known has been adopted.

R. PHENÉ SPIERS.

London,
September, 1902.

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RELATING TO

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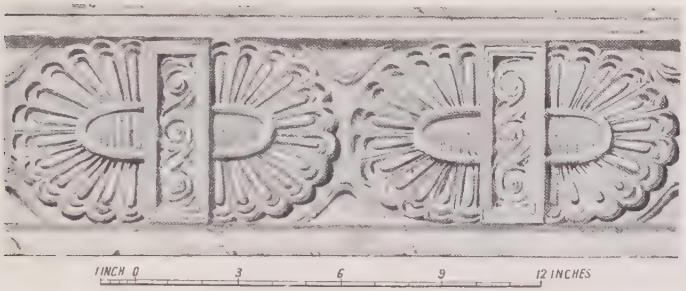
3500--2500	B.C.	Early Minôan period: first palace at Cnossus. Contact with Egypt; 6th to 11th Dynasty.
2500—2000	,,	Middle Minôan period: second palace at Cnossus. Intercommunication with Egypt; 12th Dynasty.
2000—1400	,,	Late Minôan period: third palace at Cnossus. Many contacts with 18th Dynasty: Keftians (Mycenaean) shown on tomb, 1480 B.C.
1500	,,	Introduction of Tholos tomb.
1500—1200	,,	Late Mycenaean age.
1184	,,	Fall of Troy.
1104—1103	,,	Dorian invasion; expulsion of Achaians from the Peloponnesos. Dispersion of the tribes.
1000	,,	The Heraeum at Olympia founded.
776	,,	Traditional date of first Olympiad.
734	,,	Founding of Syracuse by Dorians from Corinth.
716—546	,,	Ascendancy of Lydia. Miletus, Ephesus, Smyrna, Halicarnassus, become great cities.
700	,,	Paestum founded from Sybaris.
655—581	,,	The Cypselidae at Corinth; Great Temple built.
628	,,	Selinus founded.
582	,,	Agrigentum founded.
560	,,	Archaic temple of Diana at Ephesus built.
546	,,	Conquest of Lydia by Persians under Cyrus.
500—490	,,	Ascendancy of Aegina. Temple built.
494	,,	Miletus taken by Darius.
490	,,	Battle of Marathon.
480	,,	Battle of Salamis.
480—479	,,	Athens taken and burnt by Xerxes.
480	,,	Theron commences great temple at Agrigentum.
478—477	,,	Themistocles builds the long walls between Athens and the Piraeus.
467	,,	Cimon at Athens. First foundation walls of Parthenon.
461—429	,,	Pericles, chief administrator, in Athens.
454—438	,,	The Parthenon built. Ictinus and Callicrates, architects.
437—432	,,	The Propylaea built. Mnesicles, architect.
432	,,	Death of Phidias.
346—337	,,	Philip of Macedon supreme in Greece.
340—330	,,	Arsenal of the Piraeus built by Philon of Eleusis.
339—333	,,	Alexander invades Asia Minor and defeats Darius III. in the battle of Issus.
333	,,	Foundation of Alexandria.
320	,,	Death of Alexander the Great.
301	,,	Antioch founded by Seleucus Nicator.
191—159	,,	Eumenes II. builds the great Altar at Pergamum.
174	,,	Temple of Zeus Olympius, Athens, commenced from designs by Cossutius, a Roman architect.
129	,,	Pergamum becomes a Roman province.

See page 145 for Chronological Memoranda relating to Chapters VIII.—XV.

THE ARCHITECTURE OF GREECE AND ROME.



2.—FRAGMENT FROM CNOSSUS, CRETE.

CHAPTER I.

THE AEGEAN AGE IN GREECE.

That works of architecture as things of man's creating are inferior in interest, in excellence of design, and in perfection of workmanship, to the humblest of Nature's works outside humanity, has often been the burden of the moralising of theologian, naturalist, and astronomer. But in this reflection lies a fallacy which is fully exposed to those who can discern in the successive intellectual works of man the path of the human spirit, and who regard them as manifestations of Nature, of which he forms a part. Mysterious and impressive the instinct which causes the bird, the beaver, the insect engineer, to build for their material needs; astonishing the variety and intricacy of the results within the limits of the type. But the work of man is infinitely more complex in its nature, more profound in its meaning. A spiritual element marks it off from the work of animals: it is here that architecture begins. Building whose end and aim is the fulfilment of material wants remains building, and whatever be the nature of the material want, differs in no

essential from the work of the lower animals; but if to this be added an element of aspiration involving the exercise of a higher kind of design, there is the distinction that makes the difference. The blackbird in early spring builds a nest of a different type from that which the swallow will build later; and in a way analogous the yellow man built differently from the white man who succeeded him: and in certain respects the artistic instincts of the Celt may be distinguishable from those of the Teuton; but above and beyond this racial expression there is embodied in the architectural work of man a spiritual striving after the unattainable corresponding to the progress of this never-resting civilisation, every aspect of which—every habit, belief, and aspiration—it has power to reflect and symbolise. Works of architecture in themselves are material, perishable, incomplete; but a style of architecture is one of the higher manifestations of Nature, reaching in through the human spirit. That architecture can fail in interest, as compared with the works of Nature which lie outside humanity, is not for lack of the elements of interest, but because of the greater complexity which enters into its nature, and which makes it more than difficult to grasp its full significance.

But should we try to grasp as a whole one great period of architecture, one great style of art like that of Greece, our study is simplified in finding it present all the features of a natural growth. Art is a flower, and, like the flower of the field, is sown in obscurity, nourished by the decay of pre-existing organisms, rooted in the mire of an imperfect civilisation, and, though refined and perfected by high culture, buds and blows at its own time. It is in a large measure what the soil and the atmosphere and the sunshine make it, it repays the care and toil human hands bestow upon it, yet its form and its colour are its own. And so we may not know all the causes which produce the phenomenon, nor do we now desire to look too closely into them, but we may at least watch it grow, enjoy its full beauty, and follow it in its withering, our study remaining one of purely artistic interest, for, like the plant, it is beautiful not only when in full flower, but at every stage of progress, and even in decline.

Like other simpler natural manifestations, Greek architecture, while the fruit of all the civilisations which preceded the great period of Greek culture, did not live for itself alone,

for it has sown the seed of European architecture, and has determined the future form and growth of all subsequent European art. Behind and beyond the fountain-head which it makes for Western art, the tributary arts of Egypt, Chaldaea, Assyria, and Phoenicia shrink into their narrower channels, their sources lost in obscurity. From it flows the main stream of European culture, the arts of Rome and the Middle Ages, the rejuvenescence of Roman tradition in the fifteenth century, not to say the prevailing architecture of the cities in which we dwell. The influence of the past upon the present is part of the nature of things in which we live and move; but rarely, if ever, in the world's history have past forms and principles and ideals exercised so potent an influence on subsequent art as those of the vigorous, rarely-dowered race which settled, perhaps more than three thousand years before Christ, on the coasts and islands of the Eastern Mediterranean. We do not seem to be wrong in attributing this paramount and matchless influence chiefly on the one hand to the reasonableness, the perfection of form, and the high spirituality of their art; and on the other to the historic relation with Rome, which, taught by the vanquished, transmitted what it had assimilated to the subjugated ruder nations of the rising West. Whether epic or temple, lyric or bronze, it is by such indwelling qualities that they have been enabled to survive as a standard by which the world's subsequent efforts are measured and tested. The higher flights of literature and architecture present an almost perfect parallel. Both have more of art than science, and show little progress all down the ages within themselves, while they clearly reflect the progress of the soul of man. It may be that the greatness of the Greeks is not demonstrated most of all in their architecture, but it is by their architecture, using the word in its widest sense, that we may now most readily comprehend their civilisation in all its bearings. An eminent student of Greek language and literature said lately that he would exchange the work of one of the greatest of Greek writers for one peep into the workshop where Phidias and Ictinus perfected their marvellous designs.

We can take leave to doubt if the sight of the workshop would reveal much that would be worth the knowing, but the perfected work which that workshop turned out, and which yet remains, is it not in itself a document, for those who have eyes to read

it, more precious by far than any single work of Greek literature? To the mythologist, sculptor, architect, philologist, and historian it has opened separate fields of investigation, and from each quarter a beam of light has been shed on the whole subject of Greek civilisation. And what is true of the Parthenon in this connection is much more true of the whole architectural development from the time of Agamemnon to that of Alexander, as that is illustrated on the monuments, and all that is comprehended in them—inscriptions, sculpture, and religious, civic, or domestic furniture. In this sense architecture might be called the sheet-anchor of history, which without the everlasting testimony of the monuments would certainly become fluid and unstable. The higher critics of literature in the generation now past gave Homer between them a time-period of about seven hundred years. They mostly believed his accredited work a mass of interpolations and accretions by different authors and at different dates. They had almost succeeded in casting doubt on his very existence, and discredit on the tale he told. But architectural archaeology, in maintaining the historic truth of the Homeric epics, has in greater measure vindicated itself as the teacher of the past.

But let us not make the mistake of depreciating in return the literary side of the study. We need them both, for how much more is open to the student who studies the architectural works with full mythological knowledge, or from the point of view of the trained philologist or historian! No exposition of the subject will appear satisfactory to those whose education has fitted them to take up a standpoint in one or other of these directions. Inevitably the subject must appear as if presented in false perspective, or as if badly lighted, or carelessly drawn. But though the scope of this sketch is strictly limited to that which is comprehended in the architect's point of view, this need not mean the refusal of all historic narration, the rejection of mythological explanation, or the divorce of sculpture from its architectural setting. It involves the subservience of our programme to an architect's needs and ideals, but so rooted is the architectural purpose in the motives of the social and religious life of the Hellenes that it is believed that this point of view will give to others not specialists in any one department a broader and swifter view of the whole subject of Greek civilisation and history than is possible by any other simple

method in the same limited space. For what can tell of the Greeks more worthily than the actual buildings which the wants and ideals of their civilisation determined, their hands shaped, and their wits refined? Yet this wider historic view is only a subsidiary purpose: our business is to impart the lessons of architectural history in the new light, to give the architectural student a clear apprehension of the historic significance of style. Nothing is more likely to wean him from the misuse or feeble copyism of its characteristics than a grasp of their relation to surrounding circumstances. To this end buildings in their plan and design, rather than their details or furnishings, will be studied. Architecture is more than pottery or painted decoration the work of a nation, the symbol of a religion, the house of gods and man greater than the idols and ornaments thereof.

The division of the subject of Greek architecture is largely a geographical one. We commence with Greece, much as it is now defined in the map of Europe, leaving out of account Aetolia, Epirus, and Acarnania; and trace its history as revealed by the monuments of the primitive periods from about 1800 B.C. to the Dorian invasion. Our succeeding chapter treats of European Hellas, including in its enlarged boundaries Sicily and South Italy. From this we pass to Asia Minor and the contemporary period there, and in the following chapters dwell upon the perfections and refinements of the pure developed style, and eventually learn what we can from its slow decline.

Of the lands bordering on the Mediterranean, Greece, the part of Europe nearest to Asia Minor and to Egypt, is more profusely indented in its configuration than any other. In area Greece is smaller than Scotland; its coast-line is much longer than that of Great Britain. The whole country is a vast assemblage of high mountain peaks, much recalling, though on a grander scale, the steeper and rockier parts of the Western Highlands and Islands of Scotland. A labyrinth of land-locked harbours, of open creeks, of wild mountain tracts and ravines, it was divided and isolated one part from the other, save for the means of communication the sea afforded. The natural harbours lie open to the east and the south, stretching out their long arms as if to invite and welcome the sailor; and the island stepping-stones fill in the great geographical design, placed as if to lure the kayaks from the

coasts of Asia Minor. Were it possible to go back to the third millennium B.C. and record the events of that period in Greece, it appears as if these must have comprised the colonisation of its shores from earlier homes in Asia Minor, and its subsequent traffic with the nations of that region, just as the East has peopled the West in that larger civilisation which in our day is developing on the shores of the Atlantic Ocean. The East received back again many of its own sons, and from that time Greece was to plant colonies around the greater part of the Mediterranean and the Black Sea. Massalia in France, Sybaris in S. Italy, Syracuse and Agrigentum in Sicily, Cyrene in N. Africa, Naucratis in Egypt, are a few of the more important settlements of this wonderful people, who while often at enmity with one another, and divided in dialect, laws, and manners, spoke one language, worshipped the same gods, and mingled in the same games and festivals.

Now it is not difficult for us to trace some relation between the circumstances of the Greek race and their expression in art. Their separation into small communities, and independent comparatively peaceful development; the necessities which drove them to a seafaring life; circumstances, also, such as the extreme brilliancy, the lightness and bracing properties of their atmosphere; the clay, fine limestone, and marble in which the soil abounded; the want of metal and other commodities which led to the necessity for traffic with other lands: it is easy now to say that these and other similar causes produced the types of Greek art. But there was a good deal more than this, whichever of the two great opposing views of history we take—whether we are to regard all this material provision as a preparation for the "Glory that was Greece," or whether we are to regard that glory as a kind of accidental or fortuitous result of circumstances. Both schools would agree to put it in this way: that it was *in the race:* an instinct: a tendency: an aspiration: an inspiration. Not that the Greeks any more than others were "a nation of artists"; but the instinct in the select few was revealed and matured largely because the nation prepared an atmosphere favourable to the culture of art. They knew so well how to live; their social economy was so perfect; they lived so close to Nature, in short, that they seem to have produced the highest type of the natural man which the world has yet seen.

Progress in every department is attained only by making good use of the experience of the past; and it is more to the point that we should seek to select and profit by the true and everlasting principles of Greek art than that we should desire to know where the Greeks came from, and who they were—matters that can never concern us practically as architects or citizens: since we cannot choose for ourselves a Hellenic pedigree. Yet this sketch would be strangely incomplete if in adding up the origins of Greek art we did not take this into account and put those very natural questions to those who teach us.

In the Pelasgi we have doubtless the first inhabitants of Greece, a Turanian race, it may be, although recent research tends to show they were identical with the Mycenaean. In any case, we have in the Mycenaeans or Achaians the bed, the first swarm of the Aryans who probably crossed from Asia Minor as our Celtic ancestors came from the Continent. Like the Celts over Europe, they were an artistic race, delighting in ornament, in jewellery, in carved ivory, in pottery, in beautiful household appliances. Upon these people and their comparatively advanced civilisation descend the rude Dorians and other tribes from the North, a race probably as destitute of refining influences as our Jutes, Angles and Saxons. With this descent occurs an expulsion in Southern Greece of much of the finest blood, as obtained in our own land when the Romans left; then a period of blending ensues, obscure in history and barren in art. Returns thereafter to Greece from new Ionia some of this expatriated culture, the Ionian element, which had always maintained its hold upon Attica, and the phenomenon ensues which sixteen hundred years later will recur in other shape in the land of the Angles.

Now this may not be scientifically correct according to the latest ethnological gospel, but it is sufficient for our purpose, and it gives us a general view of the racial history of the country: while it demonstrates that the Greeks were a heterogeneous people, combining a considerable variety of characteristics, of traditions, of natural aptitudes.

It is little more than a generation since that the history of Greek art entered on a new phase by reason of the discoveries of Dr. Schliemann at Tiryns and Mycenae, a phase which has been still further emphasised during the opening years of the present century by the researches of Dr. Evans in the island

of Crete, the results of which have yielded traces of a civilisation much more important than anything succeeding it. To the drama of the history of Greece, which not so long ago opened with the scenes of the *Iliad*, there has thus been unfolded at one and the same time a prologue and a background. The richness of this prehistoric period in all manner of decorative art, to which the discoveries in Crete and the treasures in the Mycenaean room of the new Museum of Athens bear the most striking testimony, has been such as almost to overshadow, for the time, the glories of the Periclean age. It will be our aim in these chapters to gather and select out of the mass of relevant and irrelevant material published on the subject some of the principal matters of interest to the architectural student, especially those discoveries that give fuller significance to the later developments, and appear to have influenced profoundly the course of Greek art.

The district around Mycenae has hitherto been regarded as the centre of a civilisation called, for convenience, Mycenaean, but the discoveries in Crete have led archaeologists to the conclusion that Mycenaean art was only a local development of a much older one, extending over Crete and the whole of the Aegean. The broader title of Aegean might well, therefore, be adopted, but in the chronological list appended Dr. Evans's definition of Minôan has been accepted. This, however, we know, that at the period which is called the Heroic Age the country which we now recognise as Greece was peopled by numerous tribes or clans, forming practically separate states under their respective kings or chiefs. We have already hinted at the probable origin, migration, and character of these people, and it would be beyond the purpose of this book to show how their clan-groups, their roving and warlike propensities, the nature of their arts and the forms of their expression in design, have been held to point to the identity of these Achaian settlers and the Celtic race. More especially is the theory confirmed by the researches of archaeologists, who find their trail over great part of Europe and along the north coast of Africa. No doubt there is much that is purely conjecture, and it is possible to read too much into the testimony of the tumulus and barrow, and the spiral ornamental motive, the childhood of the practice of art, although they mark an epoch in the history of Europe, and testify to the substantial unity of the race over the area where such remains are found. It does not follow,

for example, because we find a trail of ornament, pottery, and jewellery of Mycenaean character over Central or Western Europe, that a people kindred to the Mycenaeans migrated in this direction: more probably the ideas migrated, or the articles themselves; but that there was a phase of widespread European civilisation, Ancient Italian, Etruscan, Celtic, call it what we may, preceding the Roman, which had some identity, or at least affinity, with Mycenaean culture, now admits of no doubt.

For the moment, however, we have to deal with primitive Greece. Here the excavations conducted by Dr. Evans in Crete have brought to light the remains of a palace at Cnossus, two or three centuries older than that which Schliemann discovered at Tiryns, and containing revelations of so early a civilisation that, as Dr. Evans says, one might imagine a new record had risen from the earth.

These excavations have shown that the legend of Minos and his maritime power, which in the first edition of this work* was put forward as suggesting the probable connection of Crete with the earliest civilisation of Greece, had a solid foundation in fact. The principal discoveries belong to the middle of the sixteenth century B.C., but they show so high a level of civilisation as to suggest many centuries of earlier development; while, according to Dr. Evans, there are certain other finds, going back to 2800 B.C., and evidences of still earlier occupation.

The palace at Cnossus, of which the principal part of the plan† has been recovered, measured about 400 feet each way, and was built round a court 200 feet long by 90 feet wide. On the south and west sides were the principal Halls of State and the King's Entrance; on the east side was the private residence of the king and queen, which, built on the slope of the hill, occupied a lower level, and at the north end was the chief entrance to the court and the offices.

On examining the plans of the palaces at Cnossus and Phaestus,‡ one is struck by the entire absence of those walls of defence which at Tiryns and Mycenae were deemed to be of the greatest importance. It may be that, as Dr. Evans observes, the bulwarks of the Minoans were in the wooden walls of their

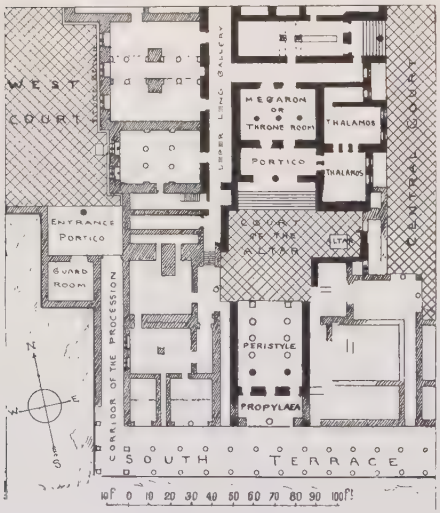
* Containing the late Mr. Anderson's lectures written in 1898.

† See R.I.B.A. Journal, 1902.

‡ A second but smaller palace excavated by the Italian Government. Plan published in Luigi Pernier's "Scavi delle Missione Italiane a Phaestos." (Mon. Ant. 1902.)

navy, and this may account for the fact that almost the only means of defence would appear to have been a tower or bastion at the north end commanding the main road from the city and port. The entrance from the open space on the west, which Dr. Evans regards as the Agora, seems to have been left quite unprotected; whilst on the east side the private residence opened on gardens or terraces, probably sheltered and made more private by trees, but enclosed by little more than a garden wall, with a single bastion.

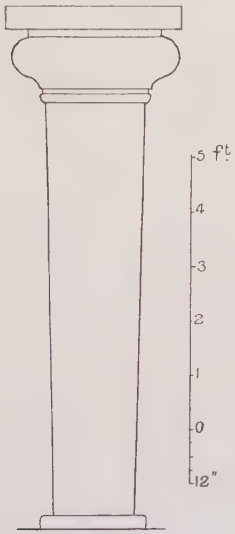
The west portion of Dr. Evans's plan shows only the basement floor, but as some of the walls rise 5 feet above the ground, a conjectural restoration of the ground floor, partly based on one suggested by Dr. Evans, is given in Ill. 3. In this is shown the western portico—the corridor of the procession—the south terrace, from which access was given to the Propylaea, leading through a hall with peristyle on either side to the court of the Altar, and, in the rear, the Megaron or Throne room with its portico and other rooms, the destination of which is unknown. The private residence, being on a lower level, is much better preserved than the state rooms. The remains consist of various halls and courts, and include a stone staircase, with return flights leading up through two storeys to the level of the central court. This staircase, as Dr. Evans remarks, "is probably unparalleled in the history of excavation, flights of stairs one above another being unknown, even in Pompeii."



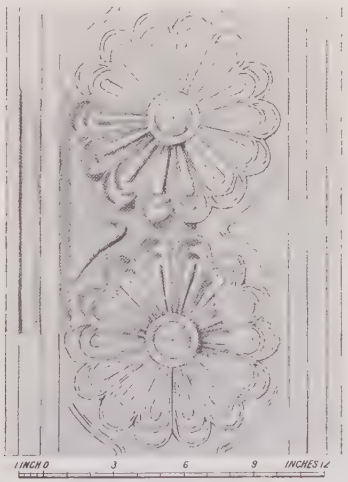
3.—CONJECTURAL RESTORATION OF PRINCIPAL FLOOR OF THE PALACE AT CNOSSUS.

Among other valuable architectural discoveries are the bases of columns of cypress wood found in various parts of the palace. Still more important is the fact that from charred ends in the council chamber, and impressed moulds in other places, Dr. Evans has been able to reproduce some of the columns

themselves. For the echinus of the capital, which was probably of stucco, he has had to depend on what is called the *Temple fresco*, a painting found on one of the walls. It represents three temples, the middle one distyle in-antis, and raised above the others, which have but one column in-antis. The latter peculiarity is proved to be no mere convention by the single base found in the entrance portico in the Propylaea, and in the portico to the throne room, besides similar instances found at Phaestus. The column thus restored tapers downwards, the diminution being about one-seventh (Ill. 4). The abacus had great projection; and in the staircase court, where it



4.—TAPERING COLUMN (RESTORED), CNOSSUS, CRETE.

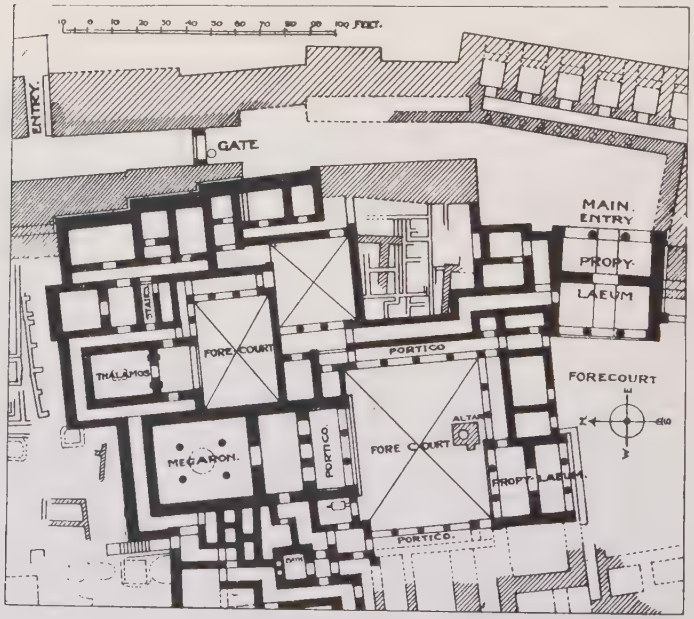


5.—ROSACES ON ARCHITRAVE OF ENTRANCE TO ALTAR COURT, CNOSSUS, CRETE.

had to carry the superstructure and the cross beams of the upper floor, it was 3 feet 5 inches square. It would seem that the Cretan architects had recognised that the trunk of a tree was equally capable of carrying weight, whether in its natural position or inverted, and that when employed in the latter position the rain would more readily fall off it, and thus tend to its better preservation. It had the further advantage that, with its greater diameter at the top, an increased support was given to the abacus. Other paintings and porcelain mosaic slabs found in the ruins suggest that the upper part of the walls, above the gypsum blocks already referred to, was built of unburnt brick or rubble

masonry with clay mortar and enclosed in timber framing, above which appeared circular discs, which may have been the ends of logs of wood supporting a floor or roof.* Two other decorative fragments were found—a triglyph frieze (Ill. 2), and portions of the architrave of the doorway of the propylaea (Ill. 5), the former similar to examples found at Mycenae (see Ill. 14), and the latter, with its rosaces and the undulating lines enclosing them, being identical with those on the architecture and lintel of a door in one of the tombs there.†

The city of Tiryns is described in Greek literature as "the elder



6.—PLAN OF THE PALACE AT TIRYNS (FROM DR. SCHLIEMANN'S WORK).

sister of Mycenae," and it is from the ruins of its acropolis or citadel palace that we best learn the character of the fortifications and the dwellings of the Heroic Age in Achaian Greece. The plan of the whole stronghold (Ill. 6) has a close resemblance to that of a fortified castle of the Middle Ages, in outline like the shape of a shoe, of which the lower castle, occupied perhaps by retainers,

* It is probable, however, that this ephemeral construction was protected externally by stucco on which the circular ends of the logs were painted as decorative features in the form of rosaces.

† See Perrot and Chipiez's "Art in Primitive Greece," vol. I., fig. 234, p. 527.

forms the heel, while the upper citadel, the part best preserved, is the ball or fore part of the foot; exhibiting a ground plan to this day of the propylaea, peristyles, megarons, and all the lesser apartments of the dwelling of a great Achaian chief. Surrounding the whole citadel or acropolis is a high wall of enormous thickness, twenty-four to fifty feet (believed by later generations to be the work of a race of giants known as the Cyclops), in the heart of which at certain points are contrived galleries, at one time thought to have been for purposes of defence, but now recognised as store-rooms. Like the domed tombs, these passages are roofed by courses of stone in horizontal beds, projecting one over the other, and cut on the under-side to the contour of a pointed arch. The principal entrance in the east wall is approached by an inclined way, so arranged that any assailants attempting this path would be subjected to an inconvenient attack upon their right flank, the side not protected by the shields, before they could reach the opening in the great wall. Even did they gain this point they would still be liable to repulse from the wall within ere reaching the second gate. Our mission is a more peaceful one, and the ascent, toilsome as it is, is beset with no greater difficulties. Arrived at the upper level, we face the propylaeum, which is worthy of attention as the earliest example, as well as the model, of all the great gateways of the Greeks, down to the great propylaea on the Athenian Acropolis. The disposition of the gateway is on the plan of the portico-in-antis, and the doorway beyond admits to a similar portico facing the other way to an open court. Passing through a second propylaeum, we enter the great court of the palace, which possesses as its chief feature the entrance to the men's apartment, or megaron. Everything indicates the importance of this room, the largest covered apartment in the building. Its façade, placed centrally in the court, presents the same arrangement as the exterior of the propylaeum, viz., a portico-in-antis, the stone bases of its columns and the stone plinth of the antae or pilasters being still *in-situ*. Beyond is the vestibule, approached from the portico by three doors, leading through a larger central door to the megaron itself. This is a large room, some thirty-nine by thirty-two feet, the roof of which would appear to have been carried on four wooden pillars. Within the oblong formed by these was the hearth, or megaron proper, which was the centre

of social intercourse and hospitality; our traditions of the fireside, the hearth and home, thus mounting back to the beginnings of European civilisation in the Peloponnesos.

In close proximity to the larger peristyle is a second court, approached by a passage direct from the propylaeum, which admits to the women's forecourt and thalamos; this passage has a break in it which ensures a certain amount of privacy, and prevents passers-by seeing direct into the forecourt. The apartment itself is similar in plan to that of the men's, but is of simpler approach and of smaller dimensions. The passage surrounding the megarons may have been for the use of slaves, serving to connect the two sides of the palace without making use of the peristyles. They were in communication with a small flight of steps leading down to what may have been the service courts of the palace.

The palace thus discovered by Schliemann was built in prehistoric times (1400—1200 B.C.), and is supposed to have been destroyed by fire in the middle of the eleventh century B.C. Besides giving the clue to the distribution of the Homeric house, as described in the *Odyssey*, it presents the origin of many features which we find reproduced in stone or marble in the perfected types of Greek architecture. Thus the propylaea, with their porticoes-in-antis, are found in the entrance gateways to the Acropolis of Athens, and to the sacred enclosures of Olympia, Epidaurus, and other Greek cities. The portico-in-antis of the megaron is the elementary form of that feature which is found in almost every Greek temple, for although in later times single or double peristyles were built round to give greater importance to the cella and to protect its walls, the pronaos, or entrance to the same, is virtually of the same plan. Perhaps the most interesting feature is that of the parastades or antae. In consequence of the ephemeral nature of the materials used in the walls of Tiryns (rubble stone bedded in clay as a base to the crude brick wall), parastades were employed to protect the faces and sides of the front walls and to assist in supporting the architrave or epistyle carried by their columns. These in the megaron, for instance, were raised on stone plinths and secured to the stone with dowels. The baulks of timber or posts placed side by side were reproduced as the antae in Greek temples when they had no longer a constructive, but only an artistic function to fulfil. The partition

wall between the portico and the vestibule was constructed entirely of wood, and although there is no evidence to prove that the jambs of the doors inclined inwards to lessen the bearing of the lintel, this inclination is found reproduced in the earliest Greek tombs, and suggests, therefore, its wooden origin.

The stone bases of the columns of the porticoes-in-antis of the propylaea, and the two megarons, and of the peristyles round the court—altogether thirty-one in number—still remained *in-situ*, and consisted of irregular blocks of limestone, with a circular die in centre, raised about $1\frac{1}{4}$ inches above the ground in order to preserve the lower end of the wooden shafts or columns, all of which had perished, as also their capitals, which were probably of wood, as none have been found. Those of the megaron had a diameter of about two feet, and were assumed by Dr. Dörpfeld in his restoration to have tapered slightly towards the top.

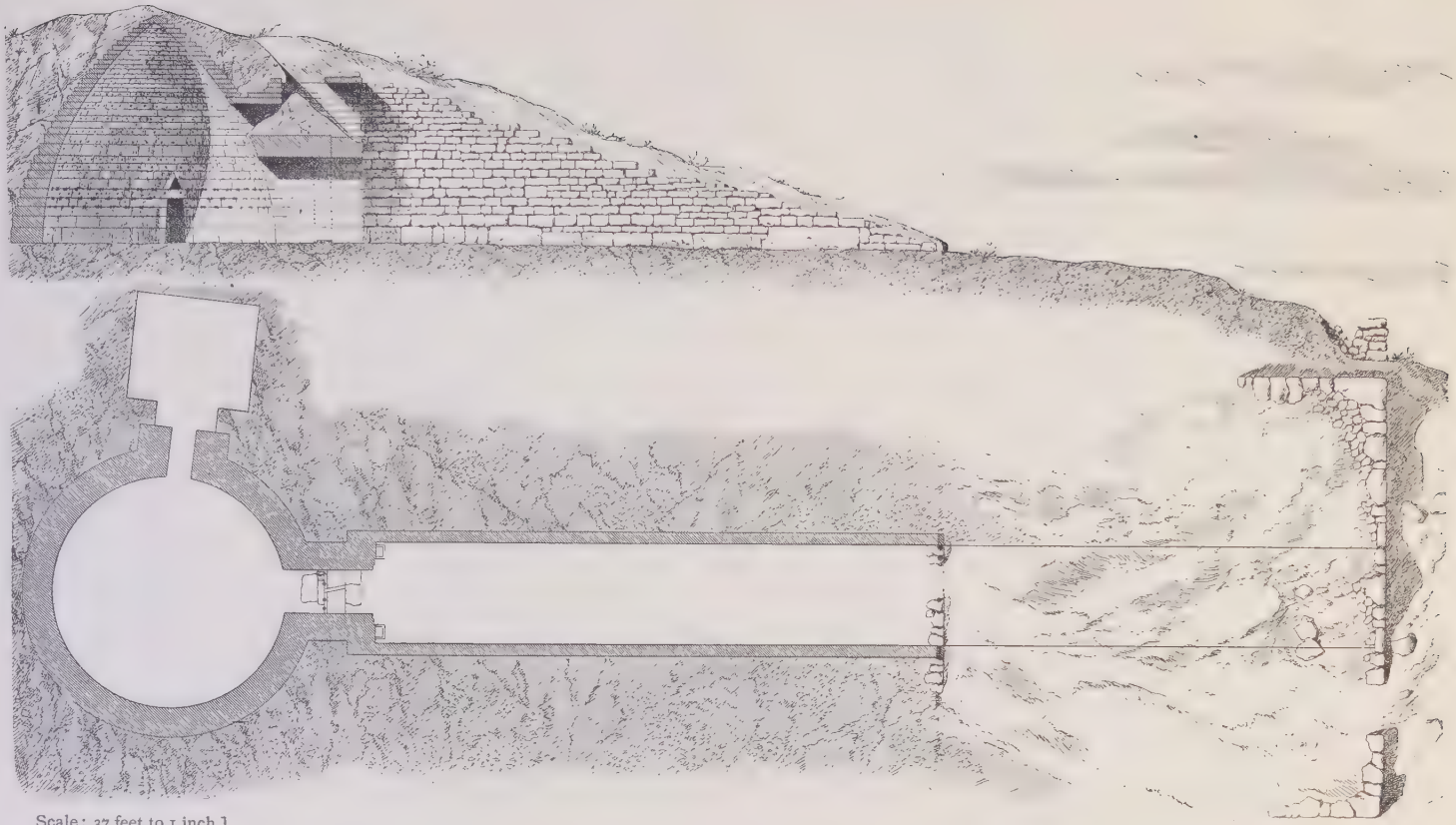
In face of the later discoveries at Cnossus already described, this assumption can no longer be maintained, and although it is not necessary to agree entirely with all the conjectural restorations put forward by Perrot and Chipiez, there is now no doubt they were right in making the columns taper towards the base, so that the credit of being the first in the field to insist upon this reversal of the column is due to them.

Rock-cut tombs, memorial cairns, barrows, or other graves are among the most frequent traces of a prehistoric race, and often the earliest attempts in architectural expression or sculptural art which have survived. And it is mostly from its tombs that the story of the age of Mycenaean culture in Greece is being gradually constructed. There are four distinct classes of tombs in the Mycenaean region, viz.:—(A) *Pit graves*, in which, as to-day, the great majority were no doubt interred. These were marked by a stela or upright slab, often sculptured in a fashion bearing a curious resemblance to the Celtic cross placed on the grave of our early British ancestors. The slab circle at Mycenae enclosed a number of these tombs in two distinct layers, the lower one consisting of five rock-cut chambers, containing fifteen bodies covered with gold ornaments and jewellery, and surrounded by all manner of arms and vessels. These Schliemann believed to be the remains of Agamemnon and his associates, though other authorities incline to make them of still more primitive date. (B) *Pyramids*, of which at least two examples exist in ruins in the district.

(C) *Rock tombs*, of which over seventy have been recently excavated. These tombs are sculptured out of solid rock, having a short and narrow passage terminated by an entrance doorway, which admits to a tomb chamber, nearly square, with a domical ceiling. Very often a smaller square chamber adjoins, entering off the larger one. In general form these tombs very closely resemble the fourth class, the *domed chamber* (D), such as that which is locally called the Tomb of Agamemnon, but is better known as the Treasury of Atreus. The opinion as to the assignation of these buildings has wavered between that of treasuries or tombs, but modern research has satisfied itself that the purpose of these chambers was that of interment of the royal dead. In all these tombs it was deemed advisable to surround the occupant with the necessities and luxuries of life; but scepticism as to their practical utility, coupled with regard for the resources of a living generation, led to the manufacture of a class of light gold-leaf ornaments and masks, which are the most prolific product of these violated graves. Of these various classes of tombs the cone-shaped constructions are the only examples that concern us architecturally. Of large dimensions, carefully-dressed stone (breccia), peculiar construction, and highly-decorative façades, they are perhaps the most important of the remains of the Mycenaean era. The Tomb of Agamemnon (if that designation be allowed) is but one of many similar tombs discovered, whose number is being yearly increased by excavation. A similar construction at Orchomenos, in Boetia, is of almost exactly the same dimensions; and there are at least seven smaller examples in Argolis, the district round Mycenae, and eleven more in other parts of Greece. There are also examples in Crete, the island of Amorgos, and the Crimea; but this Mycenaean tomb, being the largest and most perfect, may be taken as representative of the type.

The tomb (Ill. 7) consists of three parts—a dromos, or open entrance passage; a tholos, or circular chamber roofed by a dome; and a smaller chamber formed in the rock, entered from the larger one. The door which appears in the section and the internal view is that which leads to the small cell or secondary chamber. The section makes it clear that the tomb was subterranean, the masonry entirely concealed beneath a large mound of earth: it is thus of the tumulus type.

A.G.R.



Scale: 37 feet to 1 inch.]

7. PLAN AND SECTION OF THE TOMB OF AGAMEMNON AT MYCENAE.

[*Perrot and Chipiez.*

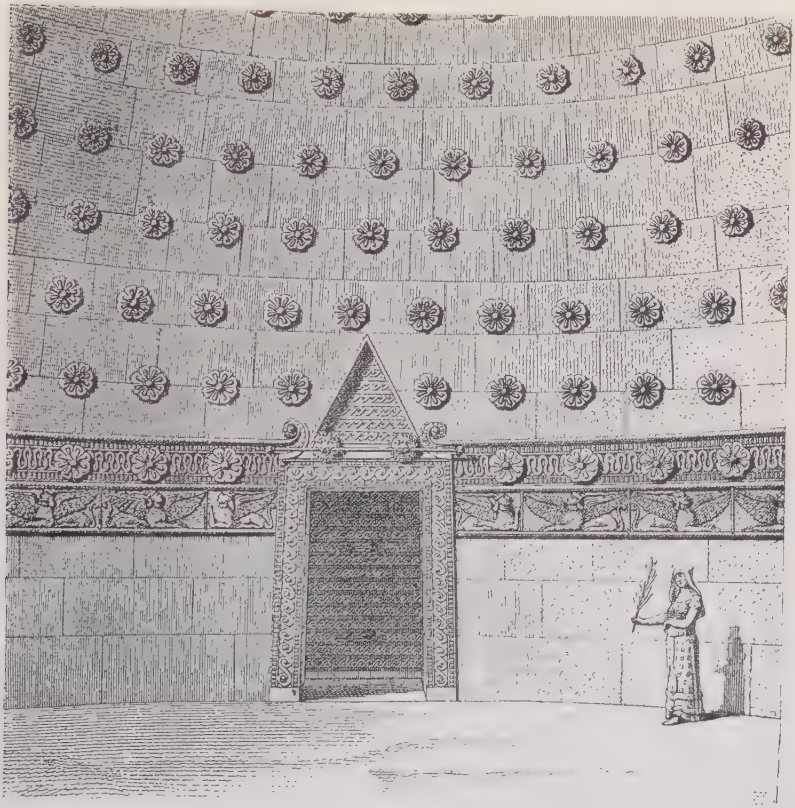
The domed part is about 48 feet 6 inches in diameter, and 45 feet 4 inches in extreme height. The parabolic curve of its pointed vault begins its course at the floor, which is formed of rammed clay. Directly upon this is laid, without other foundation, the lowest course of the masonry, of which there are thirty-four in number. The dome is not constructed on the arcuated or vault principle; the courses simply project over one another, uncemented, until by the lessening diameter of the concentric circle they meet at the top. The blocks of stone were on plan

8.—ENTRANCE TO THE TOMB OF AGAMEMNON AT MYCENAE.

square or rectangular, so that there were wide gaps at the back which were filled in with small stones and clay, even in the upper course, where the stones approached the shape of a voussoir.* The inner face of the masonry appears to have been dressed down after the construction was complete. The masonry as it exists to-day shows a great number of holes over its surface, suggesting that pins had been inserted for the purpose of securing some kind of decoration. Metal plates are suggested for various reasons, but Chipiez in his restoration

* See Perrot and Chipiez, *Art in Primitive Greece*, Vol. I. Fig. 182.

(Ill. 9) has adopted the characteristic rosette for the upper part of the dome, and a frieze of metallic laminæ for the part where the holes are larger, producing on the whole a stately and impressive interior. From the evidence of metal attachments which this dome supplies, as well as the metal overlaying which has been proved to be in use at Tiryns, it is now possible to under-

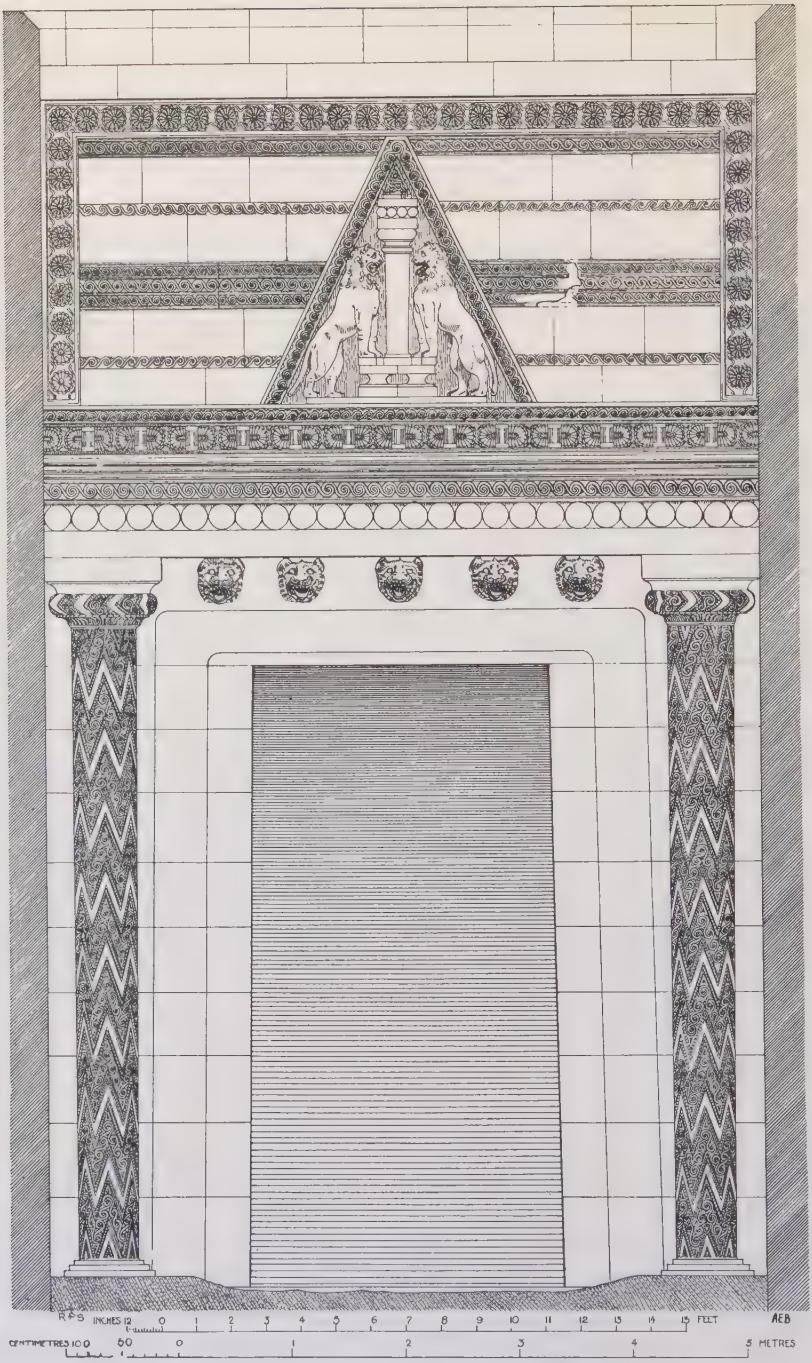


[*Restored by Perrot and Chipiez.*

9.—SECTION OF THE TOMB OF AGAMEMNON AT MYCENAE.

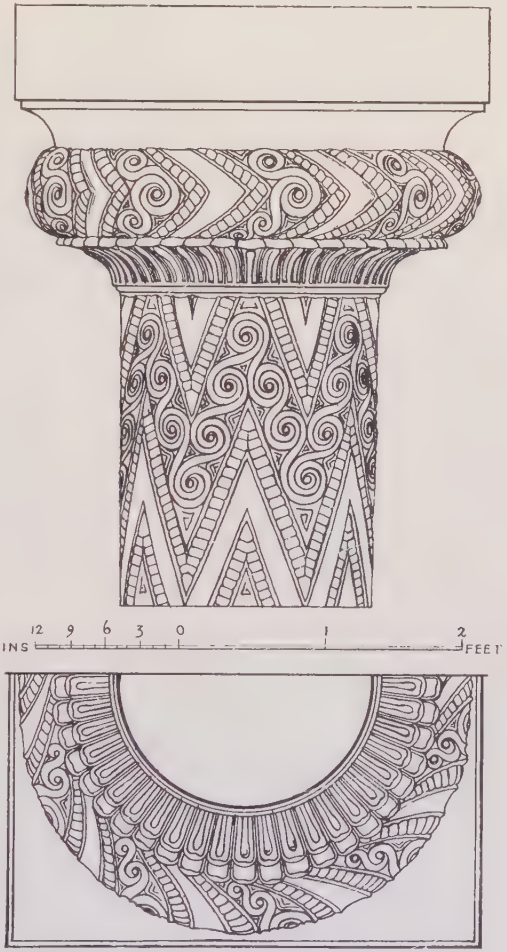
stand how Homer came to speak of brazen walls and bases, silver columns and lintels.

The dromos, or entrance passage (Ill. 8), by which the remains of the hero would be conducted to their final resting-place, is about one hundred and twenty feet long by twenty-one feet wide, and led from the valley, by a gently-inclined ascent, to a splendid portal, which even in greater degree than the cupola



10. CONJECTURAL RESTORATION OF THE ENTRANCE TO THE TOMB OF AGAMEMNON AT MYCENAE (BY R. PHENÉ SPIERS).

itself is the glory of the edifice, and may have had some symbolic significance as at once the gate and barrier of the "silent land." The present state of the doorway is shown in Ill. 8, its decorative features being distributed in various museums. The most important of these, the half-columns that flanked the doorway, have been recently presented by the Marquis of Sligo, and are set up in the British Museum. Their lower diameter is twenty and a half inches, and the upper twenty-two and a half inches, making the diminution about one-eleventh. Instead of the plain fluting seen in the tomb of Clytemnestra, the surface of the shafts is covered with nine chevron bands of alternate spiral ornament and plain (slightly concave) surfaces. Ill. 10 shows a restoration of the doorway in which all the details are drawn from existing remains (Ills. 11—14), though their arrangement, as regards the upper part, is conjectural. Above the lintel was, no doubt, an overhanging architrave (Ill. 11), partly resting on it, partly supported by the columns, and further secured by



11.—DETAILS OF COLUMN: TOMB OF AGAMEMNON AT MYCENAE.

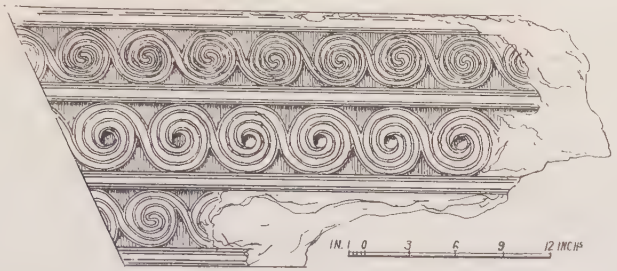
bond-stones* running through the wall. Over this architrave, but set back on the same plane as the doorway, is the upper part of the wall, in the centre of which is the triangular opening devised to take off the superincumbent weight from the lintel, in the same way as in the Gate of Lions. Here, following Lord Elgin, Cockerell, Donaldson, Blouet and Reber, the opening in the restoration has been filled with a piece of sculpture similar to that over the Gate of Lions.† The triple band of spirals (Ill. 12) in the British Museum probably formed part of the casing on the right hand side of the triangle.

The fortifications of Mycenae are much less Cyclopean in character than those of Tiryns: consisting of overhanging cliffs, they possessed greater actual strength, and interest us more for the sake of the principal and massive gateway, that of "the Lions," so called, which is in fine preservation (Ill. 15). The illustration shows the stone jambs of the door, and the still greater lintel, which is eight feet broad, over three feet thick in the middle, and has a length of sixteen and a half feet, with a clear span of nine and a half feet. Such a lintel would assuredly bear any superincumbent weight the builders of these fortifications were likely to put upon it, but either from caution or custom a similar triangular void to that which we observed over the entrance doorway to the tomb of Agamemnon (see Ill. 8) is left, so as to relieve the lintel. It was to fill this opening that the slab shown in Ill. 15 was sculptured, the subject being, perhaps, a suggestion that the lions were symbolic of the lion-hearted men within. The central pillar is, perhaps, the most interesting part of the composition to an architect, as it confirms the restoration suggested of the shafts flanking the doorway of the tomb of Agamemnon (Ill. 10). It stands on a kind of twin-pedestal or altar, and is surmounted apparently by a fragment of entablature, which, like the ornament over the tomb door, suggests the wood log ceilings of the primitive house. The sculpture is, perhaps, the oldest in Greece yet revealed, and shows a technical skill in the outline and modelling, and even a nobility of expression, as in the resolute fore-legs and paws,

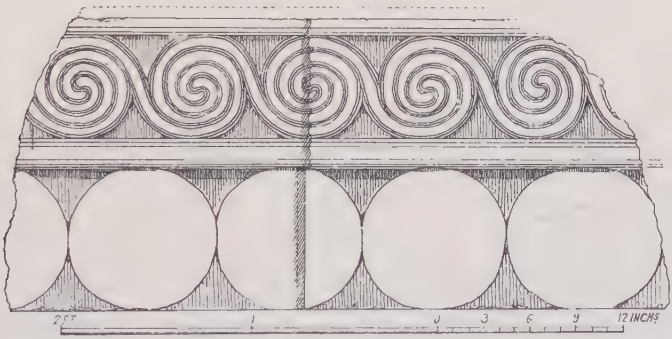
* The sinkings for these may be seen in Ill. 8.

† Perrot and Chipiez's restoration of the doorway, reproduced in the first edition of this work, is now, like Reber's impossible. It shows the columns with a diminution of one-sixth and with thirteen chevrons. There is no foundation whatever for their elaborately carved lintel, and they fail to take note of the plain projecting course crowning the wall (part of which still exists, and can be seen in Ill. 8), which was specially provided to protect the ornamental casing below.

that give it a place much higher than most of the work of the succeeding period, generally known as Archaic Greek. The heads have disappeared, and there is good reason to believe



12.—PORTION OF CASING OF THE TOMB OF AGAMEMNON, (BRITISH MUSEUM.)



13.—PORTION OF CASING OF THE TOMB OF AGAMEMNON. BRITISH MUSEUM.)

14.—FRAGMENT FROM THE GATE OF THE TOMB OF AGAMEMNON AT MYCENAE. (NATIONAL MUSEUM AT ATHENS)

that they were separately carved and attached to obtain a greater relief. Holes for the fastenings remain, and it has been suggested that they were either in bronze, red porphyry or green breccia, instead of the grey limestone of which the rest of the sculptured work is composed. It does not seem possible to

date these works later than about 1200 B.C. Indeed, Messrs. Perrot and Chipiez incline to place them about 1450 B.C.

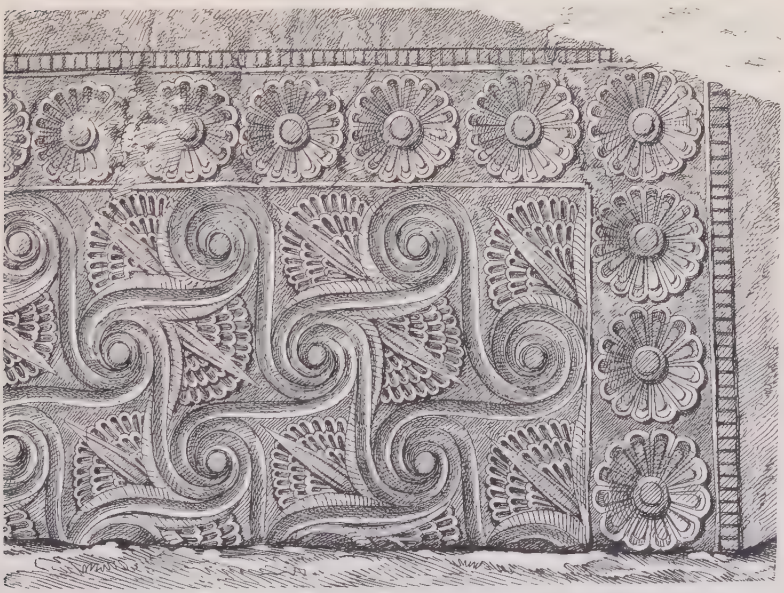
How this early civilisation, so far on the right track, and, it may be, on the way to fresh effort and initiative, was cut short and scattered by the Dorian invasion, to begin its life over again, and, in a fuller and larger way, to work out its destiny, and yet permeate with its artistic instinct the country from which it was now expelled, has yet to be considered. Five barren centuries at least elapsed before the conditions favoured what may be called the reappearance of Achaian, henceforward to be named Ionian art. For the more we dwell on the earliest periods of Greek art, the more shall we discover what is owing to it, and it is astonishing to find how many of its principles and motifs have survived. All recent discoveries have tended to show that Greek art is more essentially the product of the age of Aegean culture than has been formerly believed. We see, speaking generally, two different forms of practice: (A) *a timber style* employing stone for foundations, and, it may be, sometimes overlaid with metal; (B) *a stone style* in which wood forms are copied, and which yet made use of metal plates in its decoration. Both are closely related, both may be contemporaneous: for although the stone imitative style might naturally be thought of later growth, it may have been adopted simply because of the necessity of the special purposes of fortification and underground tombs.

To the Mycenaeans is owed the antae of the Greek temple, the inclined sides of doorway openings, which remained throughout the Greek period; while the fluting of the columns, the triglyph frieze, the patera, the rosette, the palmette, and the spiral, all are forms upon which the later Hellene has yet to exercise his refining genius and hand down ennobled to later generations.

With the greater magnificence of his temple he will adopt a peristylar plan: the weight of the stone entablature will demand a stronger support, as also a similar material, for he will seek to proportion and adjust his shaft to what it has to carry, rather than determine his entablature by the dimensions of the column. If we admit this reasonable static principle, a ray of light is thrown in upon the debated question of the origin and development of the classic orders. But this remains to be dealt with at greater length.

15. THE LIONS' GATE OF THE CITADEL OF MYCENAE.

In thus briefly summarising the architecture of the Heroic Age in Greece proper, we have not tried to search for all the causes which gave it birth, or to point out every feature; but we have noted some of its characteristics, and watched the shoot appear above the ground. The time of its flowering is still far off, and the north wind of the Dorian migration, the so-called "Return of the Heracleidae," blights the promise of its early growth; but rightly to understand Greek art, we must not fail to recognise that it was the same root, the same plant, which in the same soil rose to such surpassing perfection, and bore the Parthenon, the Propylaea, the Erechtheum, which now, withered and broken, yet lie like a memorial wreath on the hill grave of the greatest city of Greece.



16.—FRAGMENT OF SLAB FROM THE CEILING OF A CHAMBER OF THE BEEHIVE TOMB AT ORCHOMENOS, IN BOEOTIA.

17.—SCULPTURED ARCHITRAVE OF DORIC TEMPLE AT ASSOS.

CHAPTER II.

THE ARCHAIC PERIOD IN EUROPEAN HELLAS.

THE dispersion of the tribes about 1100 B.C., which is the beginning of the making of the living Greece of history, appears to have been brought about by disturbances in Epirus and Thessaly, from which regions numerous armed bands invaded the Peloponnesos, driving the original inhabitants, Ionians, Aeolians, or Achaians, to Attica and to Asia Minor. In overturning the civilisation of Achaia, being by nature rude and unskilled, they interrupted the progress of the arts, and threw back every development in this direction. But this stoppage was only temporary: as Perrot finely puts it, it is as if a fire which blazed brightly in the open had been smothered by a bundle of damp twigs: the flame is quenched temporarily, but will burst forth again more warmly and clearly. So from the mingling of the conquered and the conquering races, after the lapse of three or four centuries, issued the Dorian Greek race of history, which, meeting again with the Ionian element that had been taking a different direction, produced in Athens the highest results in art which the world had yet witnessed. It is the object of this chapter to trace the development of the Dorian type, the archaic period in the European colonies.

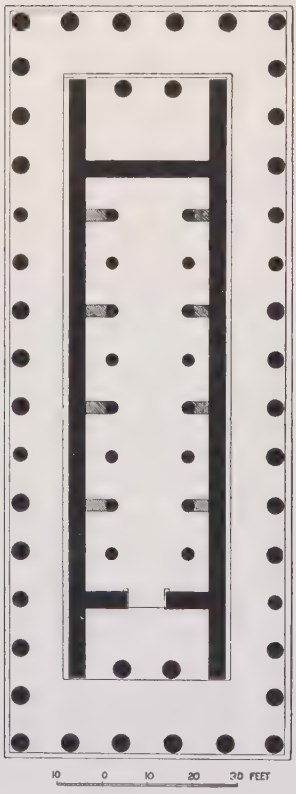
Of these marauders who entered the Peloponnesos from the north, the Dorians seem to have been at an early period marked out for future distinction, and their social customs and political order became supreme, permeating those of the associated tribes, and eventually the country they subdued. From Mount Olympus they brought with them the worship of

Apollo, the Sun-god, and the formation of the Amphictyonic Council appears to be due to their initiative. This was a kind of compact among twelve states to protect the temple of Apollo at Delphi, and to promote peace among confederate states. The chief motive of their invasion of Southern Greece may safely be set down to plunder, the great repute of the wealth of Mycenae and kindred cities sufficiently accounting for the enterprise, which in many respects presents an analogy with the invasion of Roman Italy by the Northern hordes. "The return of the Heracleidae" was the fanciful term which the Dorian tribe afterwards gave to their occupation of Southern Greece and subjugation of the real owners of the soil, assuming wrongly, as far as we can judge, that their own ancestors had been its original inhabitants. Whatever be the impulse that brought the Dorians and the associated tribes into the Peloponnesos, it was land-hunger doubtless that soon sent them swarming out of it. From every port of Greece they passed into Crete, the Southern Cyclades, Cos, and Rhodes; settled in one or two cities in Caria and the adjoining coast, and more fully took possession of Southern Italy.

The colonisation of Sicily appears to have been a later wave of migration. There is no mention of the Greeks earlier than about 735 B.C., when Naxos was founded by an Ionian colony from Chalcis, in Euboea; but this appears to have been only the signal for an overpowering Dorian occupation which began in the following year. The Dorians from Corinth founded the great cities of Syracuse in 734, Selinus in 628, and Acragas (Agrigentum) in 582 B.C.; and by colonies hiving off Syracuse the Greeks further took possession of the island coast, ousting to some degree the preceding Phoenician element, and placing under subjection the earlier inhabitants of the eastern part, a race probably akin to the Latins or Campanians, the Sikeli, from whom the island derives its name. It is the almost unexampled prosperity of these colonies, written chiefly in their marvellous Doric temples, that must now engage attention. In many ways they outstripped the mother country in the race, and their reactive influence on Greece proper is very clearly traceable. It was much as it is to-day with Europe and America: America, the offshoot of Europe, outrunning the mother countries in many things, but awakening them by its reactive influence to fuller life, and enriching them with the

fruits of its rapid and brilliant development. The art of Athens, as we know it, would have been impossible but for the earlier developments of Dorian Sicily, Magna Graecia, and the Peloponnesos on the one hand; and of the Ionian cities of Ephesus and Miletus on the other.

Of the Dorian colonies Syracuse was the greatest. It was the largest city in Sicily or the whole of Hellas, with a population of 500,000, and a circuit of twenty miles; and on one notable occasion (413 B.C.) it shattered the navy and army of Athens, which never afterwards recovered its former prestige. Next in importance were Acragas (Agrigentum, now Girgenti), "the most beautiful city of mortals," Selinus, and Segesta. To these we shall return later on; for the moment we must pass to the earlier examples of the Doric order, and endeavour to follow their gradual development.



18.—PLAN OF THE HERAEUM AT OLYMPIA.

The earliest peripteral Greek temple of which remains have been found sufficient to determine its restoration is the Heraeum at Olympia (Ill. 18). The date of its foundation is attributed to the eleventh century B.C., and there are certain peculiarities in its plan and construction which suggest a very early date. The relative proportion of its width to its length, 2 to $5\frac{1}{2}$, differs from the ordinary Greek temple, which is as 3 to 7. There are six columns on the front and sixteen on the side, and it stands on two steps instead of three. The wide intercolumniation shows that the epistyle or architrave was in wood, and that the columns were in the same material is suggested, firstly, by the existence of one oak column in the opisthodomus referred to by Pausanias, and, secondly, that the columns vary considerably in their diameter and character. Some of the shafts are

monolithic, others built of drums, and the echinus of the various capitals differs in contour and projection: all these facts point to the conclusion now generally accepted, that the original wooden columns were replaced gradually by those in stone.* The walls of the cella were of great thickness, the base consisting of four narrow courses of masonry to the height of three feet, the exterior face toward the peristyle being protected by vertical slabs of stone. As the foundation walls of the earlier buildings were either in rubble masonry set in clay mortar, or in narrow courses of stone which might easily be displaced, they required a protection of this nature; but the traditional custom remains throughout all Greek temples of having this dado of vertical slabs, known as the orthostatae, outside the cella walls (see Ill. 59, p. 76); on these foundation walls rested a superstructure of crude or unburnt brick.†

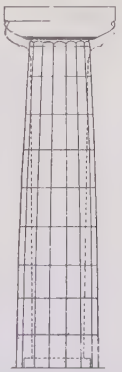
Here also, as at Tiryns, the ends of the side walls of the pronaos and opisthodomus were encased with timber in order to carry (in conjunction with the columns between) the architrave and superstructure; the jambs of the door leading to the cella being similarly encased.

In the interior of the cella, on either side, was a range of eight columns, to lessen the bearing of the main beams carrying the roof and the ceiling‡ over the cella, and dispense with the support of the crude brick walls. These columns would seem to have been alternately attached by spur walls to the cella

* If, in accordance with Mycenaean precedent, the original wooden columns of temples tapered downwards, a change to stone possibly accounts, not only for the reversal of that tapering, but also for the absence of a base to the Doric column. The upper diameter was fixed by the original capital; if the stone column had tapered downwards like the wooden one, the lower drums would have been crushed; so the obvious solution was to reverse the tapering. Now, the upper diameter of the earliest stone column of the temple of Hera was three feet two inches. Taking an average diminution of one-ninth, the lower diameter of the wooden column was probably about two feet ten inches, and the width of its base three feet two inches (if it was four inches wider as at Tiryns). But the lower diameter of the stone column is four feet two inches; consequently, to give it an even bed, it was necessary to work off the old base.

† It is to the latter that we owe the preservation of the statue of Hermes by Praxiteles, which was found buried in the clay of the original walls at the foot of its pedestal.

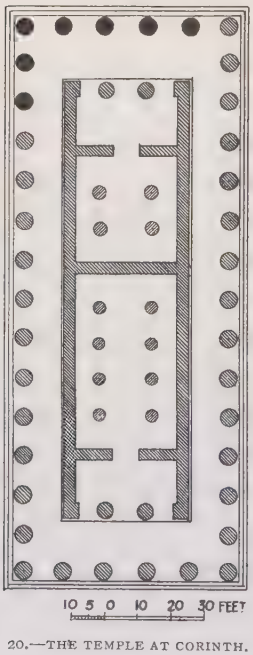
‡ The existence of a ceiling under the sloping roof is suggested by a story told by Pausanias, v. 20, 4, in which he says that "when the Eleans were repairing the dilapidated roof of the Heraeum the corpse of a foot-soldier was found between the ceiling and the roof."



19.—TIMBER AND STONE COLUMNS COMPARED.

wall to give further strength to the latter. The roof was covered with terra-cotta tiles, with cornices, pediments, and antefixae in the same material, all richly painted in bright colours.

The archaeological value of the Heraeum, therefore, is of the greatest importance, as it confirms the evidence already quoted in the antae of the Megaron at Tiryns as to the origin of that feature; it accounts also for the vertical slabs of stone found in the lower portion of the outside of the cella walls. In addition to the examples found in Crete, it affords sufficient evidence to show that the Doric column in its earliest stages was of wood,* that the diameter diminished downwards, that the echinus formed from the first an essential feature between the abacus and the shaft, and that the abacus was of much greater width than the diameter of the column.† These two latter facts militate seriously against the theory that there was any connection between the Greek Doric column and the so-called protodoric examples at Beni-hasan and at Karnak, and Der-el-Bahari at Thebes. This becomes the more evident when we come to examine the examples next in date to the Heraeum, *viz.*, the temple at Corinth, attributed to the seventh century, and those of the temple of Apollo and the Olympieium, at Syracuse. In all of these cases stone was employed, the shafts or monoliths being a little over four diameters high, with wide-spreading abacus above the echinus, so much so that in the Temple of Apollo they are nearly contiguous.



20.—THE TEMPLE AT CORINTH.

If the columns and capitals of these temples, and their relative proportions of diameter to height, may be accepted as the types

* The bases which carried the original wood columns of the temple of Apollo at Thermon in Aetolia and the archaic temple at Argos have been found *in-situ*. The former, built between the tenth and seventh centuries B.C., had five columns in front, fifteen columns on the flank, and four rows of columns down the centre of the cella, in order to carry the roof, no reliance being placed on the support of the walls of the cella, which were probably of unburnt brick.

† In the capital found at Tiryns of a temple built over the site of the Megaron the abacus is nearly twice as wide as the upper diameter of the shaft.

of the earliest Greek Doric order, it would be difficult to find a wider dissemblance than that which exists between them and the Egyptian fluted column, where the proportion varies from $5\frac{1}{2}$ to 6 diameters, where there is no echinus, and the abacus is of the same width as the upper part of the shaft.*

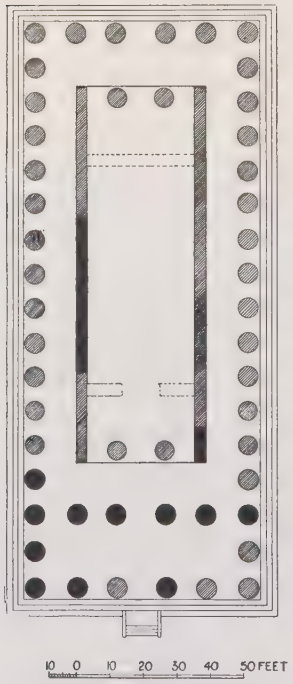
The Megaron of Tiryns, with its portico-in-antis, being regarded as the first type selected for the cella or shrine of the god, then the peristyle built round it, as exemplified in the Heraeum, becomes the second type, and the greater importance given to the cella by the peristyle may have been suggested by the desire to afford a better protection to the walls of crude brick and to

21.—REMAINS OF TEMPLE AT CORINTH.

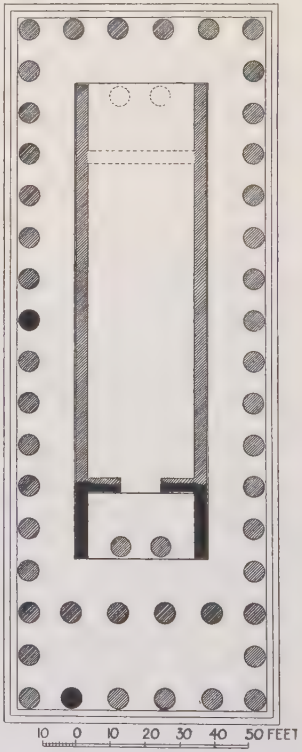
the paintings on the stucco coating given to those walls. This clashes somewhat with the theory of the gradual evolution suggested by Vitruvius in the prostyle and amphiprostyle temples, of which very few early examples have been found. The general tendency in the development of the hexastyle temple would appear to have been in the diminution of its length in proportion to its width. Thus, whilst two of the first stone temples, viz., those of Apollo and of the Olympieium at Syracuse

* There comes a further reflection, that if the Greeks copied one type of Egyptian column, why should they not have adopted others? At Beni-hasan the lotus capital exists in the interior of many tombs, and at Thebes both the lotus and the bell-shaped capital are found in great profusion, and yet the latter did not make its appearance in Greece till the fifth century. The so-called proto-doric column also ceased to be employed after the XIXth dynasty (1300 B.C.).

had seventeen columns on the flanks, and the older Parthenon sixteen, in those of later date fourteen to twelve is the average, there being one or two exceptional examples, such as the temple, C, at Selinus,* where there are seventeen, as also the temple, R, and the temple at Corinth, where there are fifteen.



22.—THE TEMPLE OF APOLLO AT SYRACUSE.



23.—THE OLYMPIEIUM AT SYRACUSE.

In the two first named, however, an additional portico two columns in depth seems to have been added to the main front.

Other changes may be noted in the proportions of the cella, which in the Heraeum at Olympia and the temples of Apollo and of the Olympieium at Syracuse, at Corinth, and in the temples

* The dedication of the temples not being accurately known, they are usually described under the letters given to them by Hittorff and Zanth in their work "Sicile Antique." Those in the Acropolis are known as A, B, C, and D; those in the plain, about 1,000 yards to the north-east, as R, S, and T, sometimes described under E, F, and G; another temple lately discovered on the Acropolis is designated O (see Ill. 35, p. 40).

C and S at Selinus, is very narrow compared with its length. The peristyle also of these early temples was much wider, the cella wall no longer corresponding with the line of the second column on each side of front.

The temple at Corinth and those of Apollo and of the Olympieium at Syracuse (Ills. 21—23) are the earliest known examples of peripteral temples in stone, dating from the latter half of the seventh and the beginning of the sixth centuries. It is not easy at first to account for the enormous diameter of the columns and their close inter-columniation, if, as is generally believed, they were copies of wooden originals. The new circumstances, however, demanded a different treatment, and the Greeks, who were always timid as to the bearing value of stone (the triangular opening of discharge over the enormous lintel of the entrance to the Treasury of Athens is a case in point), seemed to have considered that the immense weight of the entablature and the stone beams and lacunaria of the peristyle required columns set close together, being sometimes less than a diameter apart. In European Hellas the temple at Corinth, built from the first with columns and entablature in stone, is perhaps the most ancient of those which have come down to us. This is only natural, for we have reason to believe that the city was an early centre of Dorian influence, and one which was in close touch with all the western colonies. Of this temple but seven columns, twenty-three feet six inches high, remain, the shafts of which are monoliths, with a lower diameter of five feet eight inches, the relation of diameter to height being 1 : 4·16. The temple was hexastyle, with fifteen columns on the flank, and presents the unusual feature of a double cella, one facing east, the other west. The date is probably the middle of the seventh century B.C., though it has been restored in Roman times.

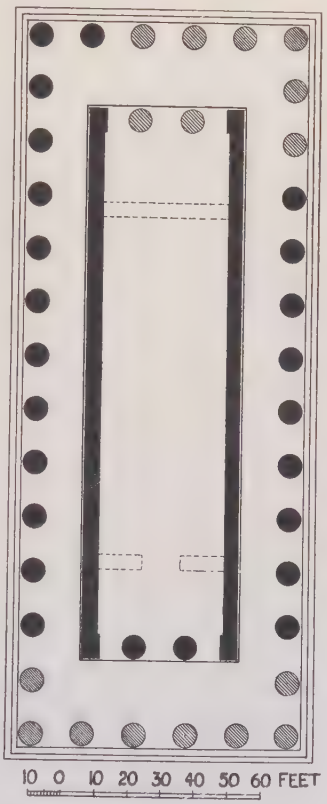
The next example in date, besides those already quoted, is that of the temple C at Selinus, 575 B.C., on the site of which were found the archaic metopes now in the museum in Palermo. Their chief interest lies in the fact that they are the most ancient Greek sculptures known, with the exception of those over the Lions' Gate at Mycenae. The metopes are in high relief and extremely vigorous in execution, but are lacking in the dignity of the nearly contemporary Ionian sculptures of the archaic temple of Diana at Ephesus. The relief which represents a chariot and horses in elevation is the most

remarkable, because the foreshortening is difficult, and to give the sculptor more scope the metope has been sunk to nearly twice the depth of the others. Another metope represents Perseus beheading the Medusa (Ill. 24). In comparison with the stele of Chrysapha near Sparta the latter are almost flat on face, and are worked on a series of receding planes, the face of each plane being kept quite flat. To such comparatively compromising examples we owe the origin of the metopes of the later Doric temples, and even in the Parthenon the archaism of flat receding planes lingers with the happiest effect in the Panathenaic frieze.

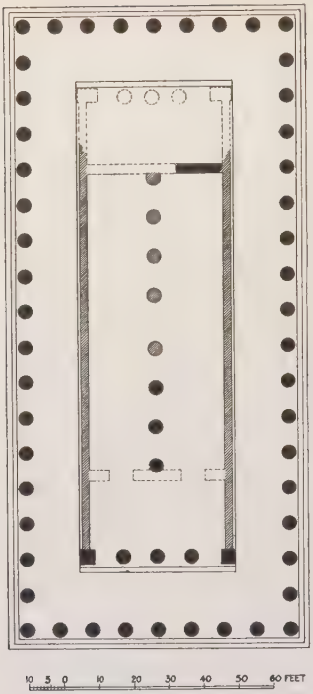
24.—METOPE FROM TEMPLE C AT SELINUS: PERSEUS BEHEADS THE MEDUSA IN THE PRESENCE OF ATHENA.

Before leaving the archaic temples in Sicily there is one other later example in Syracuse, in the island of Ortygia —the temple of Minerva (Ill. 25), ascribed to the fifth century B.C., which owes its partial preservation to the fact that it has been converted into the cathedral of the town. The cella now forms the nave of the church, and the cutting of large arched openings into the peristyle and building up walls between the columns have converted the same into aisles. The temple was hexastyle, and measuring as it did on the stylobate seventy-four feet by one hundred and eighty-five feet, it has become a fair-sized church, though its beauty has been marred by repeated alterations and the total destruction of its main front.

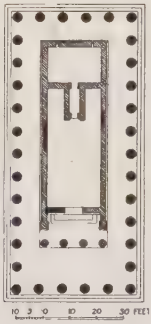
Of the three great temples at Paestum (Ills. 26—31) (Poseidonia), that dedicated to Poseidon (Neptune) is one of the best preserved and retains still the double range of superposed columns in the cella (Ills. 30, 31), the sole object of which would appear to have been the support of the ceiling and roof, as there is no trace of any gallery, and the steps beyond the pronaos led only to the roof. The relative proportion of diameter to height of its columns, 1 to 4·24, and the projection of their capitals would suggest an earlier date than that put forward by Koldewey and Puchstein (viz., 440 B.C.), who have in their work *Unter-italien* reversed the order of the three buildings at Paestum, and placed the so-called Basilica first. The discovery of the foundations of an immense altar at the east end of the basilica has led to the conclusion that it was a temple consecrated to two deities. It had nine columns on the east and west fronts, with eighteen on the flanks, and a row of eight columns down the centre of the cella (Ill. 26). Its capitals, as also those of the temple of Demeter (Ceres), differ widely from any other known example in the decorative treatment of the neck or gorge. In both cases there is a cavetto sinking in the neck, and a range of leaves round, which project forward and resemble those of the capitals of the columns flanking the entrance door of the Tomb of Agamemnon at Mycenae (Ill. 10), except that in the latter the leaves are triple instead of being single, as at Paestum. The decoration in relief on the lower portion of the echinus of the Basilica is varied, there being three or four designs, two of which are Ionian in style, one of them (Ill. 32) recalling a similar design



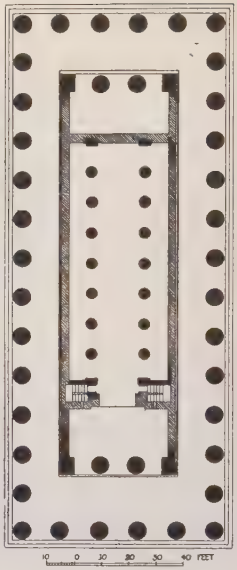
25.—TEMPLE OF MINERVA ATHENA AT SYRACUSE.



26.—THE SO CALLED BASILICA



27.—THE TEMPLE OF CERES.



28.—THE TEMPLE OF NEPTUNE.

THE THREE GREAT TEMPLES AT PAESTUM.

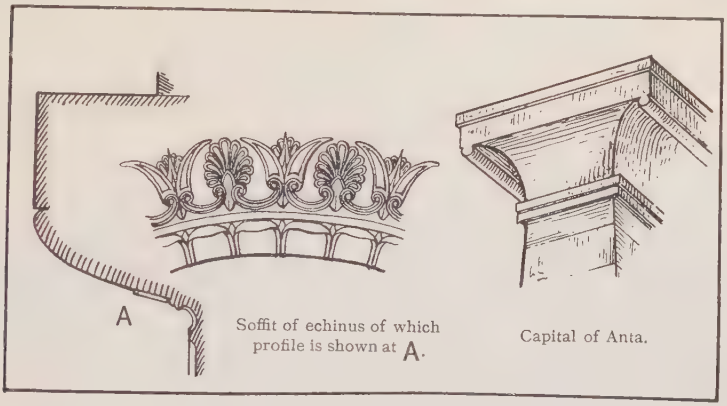
29.—VIEW OF THE SO-CALLED BASILICA AT PAESTUM, SHOWING THE REMAINS OF THE ROW OF COLUMNS DOWN THE CENTRE OF THE CELLA.

30. THE TEMPLE OF NEPTUNE AT PAESTUM.

31. THE TEMPLE OF NEPTUNE AT PAESTUM.

INTERIOR VIEW.

of the anthemion which decorated the soffit of the cornice and the door architrave of the Treasury of the Cnidians at Delphi (Ill. 86, p. 103). The capitals of the antae in the Basilica



32.—DETAILS FROM THE BASILICA AT PAESTUM.

at Paestum (Ill. 32) are also of unusual form, the only parallel being those found in temple T at Selinus. In the temple of Ceres the intercolumniation of the two outer columns on each face being the same as that of the other columns, a wider metope was required to allow the triglyph to be placed at the angle.* The cavetto sinking in the neck of the capital of the Basilica and Temple of Ceres above referred to is found also in the temple of Apollo at Metapontum; in all three examples there is a remarkable diminution in the upper diameter, and the curved entasis is more emphasised than that of any other temple.

Two other examples of the more fully developed Archaic Doric style are found: at Assos, in the Troad, a hexastyle peripteral temple, with long cella and no opisthodomus, the interest of which lies in its sculptured architrave (Ill. 17), the only example known of so great a departure from precedent; and the temple of Aphaea at Aegina, both belonging to about the commencement of the fifth century B.C., though the archaic

* It happens that all the four angles of the two fronts are gone, and Labrouste in his restoration places a half-metope at the corner, and the triglyph in the axis of the angle column. A metope, however, measuring three feet eight inches instead of two feet nine inches (the average dimension of the others), has lately been found, so that the triglyph was in its proper place, viz.: at the corner. In the older examples, according to Penrose, the metopes were usually square, but in the Parthenon and the temple of Theseus the width exceeds the height.

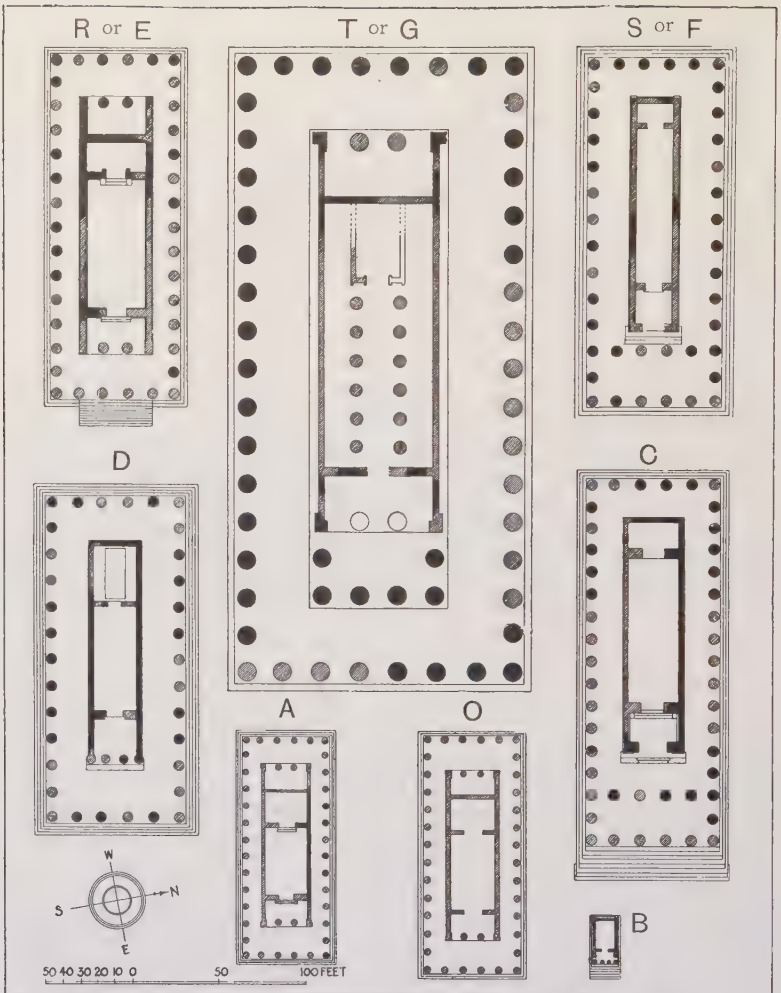
character of the sculpture in the latter case might claim an earlier date were it not for the perfect development of its plan.

We come again to Sicily, to take up the later examples. It would seem that each of the great Sicilian cities was a separate commonwealth, governed often by a king or "tyrant," for this, strangely enough, was one of the points which distinguished the colonial Greeks from the citizens of the mother country. As in Italy of mediaeval times, they bore rule over subject cities, and Syracuse and Agrigentum had each their sphere of influence. Their trade was largely with Carthage, yet it was with the defeat of the Carthaginians (480 B.C.), at the same time as the Athenians were beating back the Persians at Marathon and Salamis, that the great age of the Sicilian cities began. For in this respect the Carthaginian war and the Persian wars were beneficial, that they aided the development of race feeling, and led the Greeks of the Sicilian cities, as well as those of Greece, to act together in the face of a common danger as they had never done before. Besides the wealth and influence their victories brought them, they had no small share in the subsequent artistic developments. This year, 480 B.C., marks a convenient point from which to date the architecture of the coast. Previous to 480 we have the archaic style pure and simple; after 480 a period of preparation, a transition towards culmination, which, owing partly to the decline of the Sicilian towns, was only consummated in Greece, and chiefly in Athens. The temples at Agrigentum and at Segesta, and the greater number of those at Selinus, belong to the period of transition.

The temple at Segesta, to the north-west of Sicily (Ills. 33 and 34), is one of the most impressive structures, owing to its isolated position in the hills and its perfect preservation. It has, however, other points of interest in that, never having been completed, the columns are *en bloc*, the flutings not being worked, the stones of the stylobate are only drafted, and the ancones, or blocks by which the stones were moved, still remain. The cella also was apparently never built, and this fact not only shows the complete independence of the peristyle, but suggests that in these peristylar temples the first part executed was not the cella, but the peristyle. The temple dates from the latter half of the fifth century, and the subjugation of the city by the Carthaginians in 409 probably stopped its completion.

33.—THE TEMPLE AT SEGESTA: THE EXTERIOR.

34.—THE TEMPLE AT SEGESTA: THE INTERIOR



35.—PLANS OF THE TEMPLES AT SELINUS, SICILY.

The outline sketches (on left) indicate the position of the temples on the Acropolis, and (on right) those situate in the plain.

Besides temple C at Selinus, there are five other hexastyle temples, known as A, D, R, S, and O; a prostyle temple, B, with square cella; and the magnificent octostyle pseudodipteral temple, T,* never quite completed from the same cause as that at Segesta. The plans of all these temples are shown in Ill. 35. The largest temple, T, measured no less than one hundred and sixty-three feet by three hundred and sixty feet. The columns were 4·76 diameters high, but of two periods, if one may judge by the difference in the upper diameters of the examples found in the earliest (attributed to 540 B.C.), where the diminution is very nearly half a diameter. In both cases the lower diameter is eleven feet two inches; the upper diameter of the early example is six feet three inches, and of the latter eight feet. These temples were all built in limestone from quarries about seven miles from Selinus, and were covered with a fine coating of plaster,† which in many cases remains perfect with the original colouring. The temples are all in absolute ruin, having been apparently thrown down by earthquakes, and this may in some cases have accounted for the preservation of the colours. With the exception of O, all the temples were measured and reproduced by Hittorff and Zanth in their work *Sicile Antique*, and their description constitutes a most valuable record of the extent to which the Greek temples were enriched by colour and gilding. The chief characteristic of the hexastyle temples is the great length of the cella compared with the width, the wide peristyles, the absence of the posticum in some of them, and in temple D the substitution of attached round columns instead of antae to the pronaos. A remarkable Ionic capital is shown in Hittorff's restoration of temple B, which belonged probably to a votive column, as the order of the prostyle is now recognised as Doric.

The city of Agrigentum (Acragas) is one of the most remarkable examples of the way in which the Greeks availed themselves of the peculiarities of the site to give grandeur and emphasis to their temples. The ancient city was about ten miles in circumference, with two nearly parallel ranges of calcareous hills on

* R, S, and T are in some descriptions distinguished as E, F, and G.

† The fine coat of plaster or stucco was employed by the Greeks: 1stly, to fill in the crevices in the limestone; 2ndly, to enable a greater refinement to be given to the contour of the mouldings; and 3rdly, to provide a suitable ground for the subsequent enrichment in colour. See Hittorff and Zanth, *Architecture antique de la Sicile*, and Hittorff's *Restitution du temple d'Empédocle à Sélinonte, ou l'architecture polychrôme chez les Grecs*.

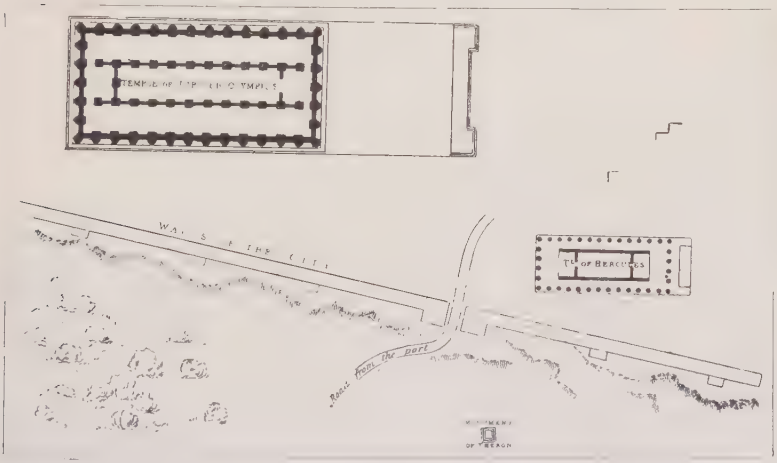
the north and south. The highest range on the north became the acropolis, surrounded with walls and crowned with the principal temple, of which only six columns remain, embedded in the Sicilian Gothic cathedral. This acropolis is now the modern town of Girgenti. On the cresting of the southern range, which lies parallel to the seaboard, and for the length of half a mile, are the remains of five or six temples. Below the two ranges, in the hollow, and sheltered from the north and north-east winds, stood the ancient city, now completely lost. It is the magnificent treatment of the southern range which suggests

36.—THE TEMPLE OF JUNO LACINIA AT AGRIGENTUM.

one of the lessons we may learn from Greek architecture. The Greeks did not think of cutting down the hills, or even of levelling the rock which their architectural work was to crown: they rather made the most of their natural character, and the best of what natural irregularities they presented (Ill. 36). They wedded art to nature, and so united their work with the everlasting hills that it seems to be part of the same design. At the eastern, the highest point of the range, is the temple of Juno Lacinia, raised on a platform to give it greater prominence. Then follow in succession the temples of Concord, Hercules (near the base of which is the sea-gate, restored in

38. THE TEMPLE OF CONCORD AT AGRIGENTUM.

the illustration from Viollet-le-Duc) (Ill. 39), Jupiter Olympius (Ill. 37), Castor and Pollux, and Vulcan. The city walls facing the sea were hewn out of the solid rock, with tombs and sepulchral niches, and a broad terrace set out on the crest, with flights of steps to the several temples. Of these the best preserved is the temple of Concord * (Ill. 38), which was at one time converted into a church, in the same way as the Cathedral of Syracuse. This temple, as also those of Juno Lacinia, Hercules, and Castor and Pollux, is of the ordinary hexastyle peripteral type, the temple of Hercules being the



37.—PLANS OF THE TEMPLES OF JUPITER OLYMPIUS AND HERCULES AT AGRIGENTUM.

most ancient, dating from the commencement of the fifth century.

The most remarkable temple in size and design is that of Jupiter Olympius (Ill. 40), the largest in Sicily, its stylobate measuring one hundred and eighty-two feet by three hundred and sixty-three feet, nearly three times the size of the temple of Concord.

The temple had seven columns on the main front, fourteen on the flanks, and is technically described as heptastyle pseudo-

* According to M. Choisy (*Histoire de l'architecture*, vol. i. p. 440), a cornice runs round the cella, above which is a sinking made to receive a flat ceiling, and openings in the cross walls of the pronaos and epinaos† allowed of a free passage through from one end to the other, the two stone staircases leading to the same still existing.

† See definition in glossary.

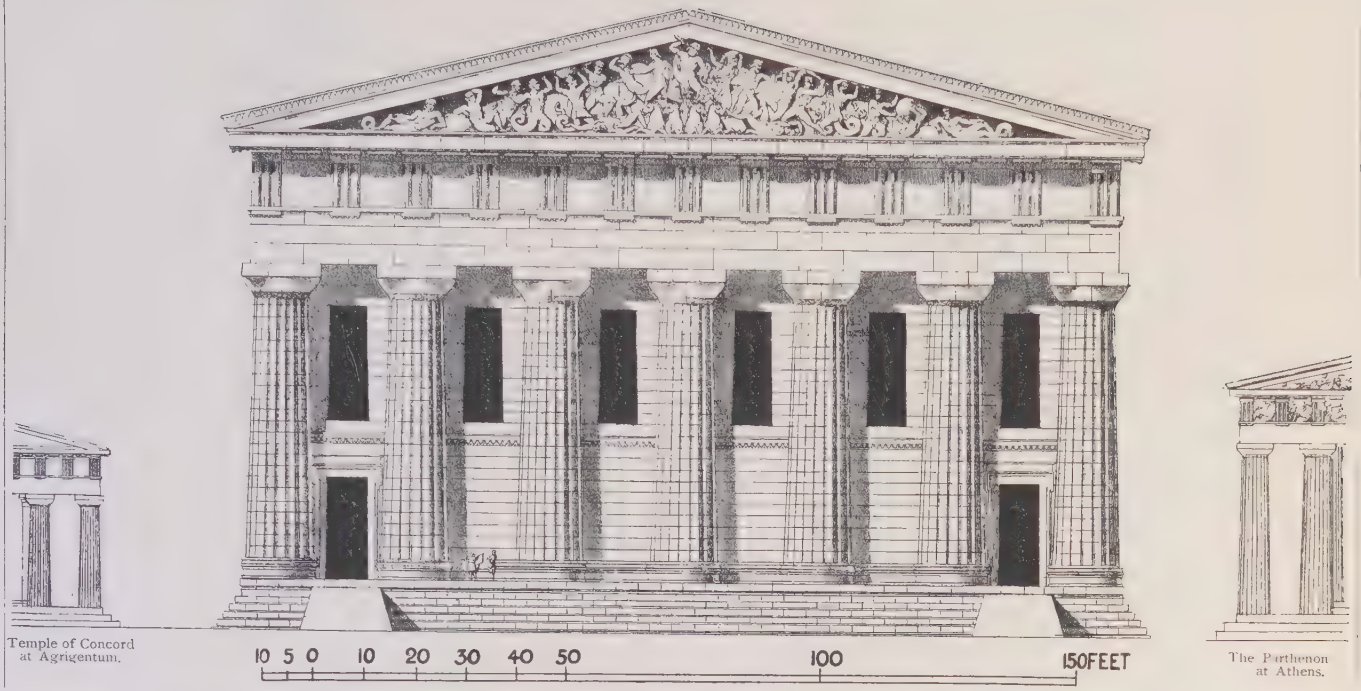
peripteral. The dimensions have not been determined with exactness, nor is the exact position of the colossal telamones (atlantes), twenty-seven feet high, known. The fragments of one of these were collected and put together by Cockerell, who, in his restoration, assumed that they were raised on the square pilasters of the interior of the cella, and carried the timber roof. The order was on so gigantic a scale that the intercolumniations were filled with a screen wall, possibly pierced with windows. The base given to the columns, which is suggestive of Ionian influence, and the stylobate raised on a base with four steps below, are all innovations peculiar to this temple, which is

39.—THE TEMPLE OF HERCULES AND THE SEA GATE AT AGRIGENTUM.*

more remarkable for its size than for any other qualities. It would seem, however, to have suggested the employment of semi-detached columns in two other temples in Sicily, where it was not warranted by the dimensions. The Temple of Aesculapius at Girgenti (Ill. 41) and the Temple of Serapis at Taormina might be described as distyle, pseudo-amphi-distyle in Greece is a portico of two Doric columns-in-antis and in the rear two semi-detached columns between antae. They are both of comparatively late date, c. 210 B.C.

If the relative proportion of the diameter of the column to its height may be taken as a criterion as to date, the temples at

* The above illustration, taken from Viollet-le-Duc's *Entretiens*, shows only thirteen columns on the flank, whereas there are fifteen.



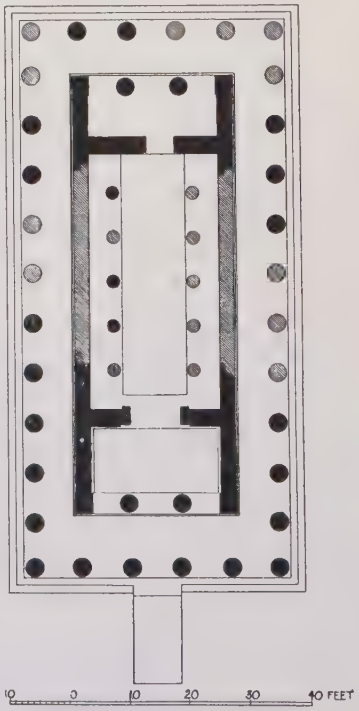
40. THE TEMPLE OF JUPITER OLYMPIUS AT AGRIGENTUM.

RESTORED BY PROFESSOR COCKERELL.

41.—THE TEMPLE OF AESCULAPIUS AT GIRGENTI.

Assos and Aegina, 1 : 5·19 and 1 : 5·30 respectively, place them in the first half of the fifth century. As regards the temple at Assos, in the Troad, its distance from Attica may account for its archaic character both in plan and decorative sculpture. The cella is of great length compared with its width, and there is no epinaos. Its chief interest lies in the sculptured architrave, already referred to. The temple of Athena* at Aegina (Ill. 42) is one of the best preserved examples of this late archaic type, and the marble sculptures from the pediment, ascribed to 480 B.C., discovered by Cockerell and Baron Haller, and now in Munich, though they show a great advance in the technical perfection of their execution, still adhere to the conventional expressions of the older style. The roof tiles of the pediment and the cymatium only were in Parian marble, the remainder being in terra-cotta, the temple itself being built in the limestone of the district, coated with a thin layer of stucco, and richly painted.

The existence within the cella of rows of columns on each side has led French archaeologists in particular to assume that the centre was open to the sky ; but the primary object of these columns was either to carry a flat ceiling or to assist in supporting the beams of the roof. And, although there may have been some exceptional instances of hypaethral temples, as in the case of the temple of Jupiter Olympius at

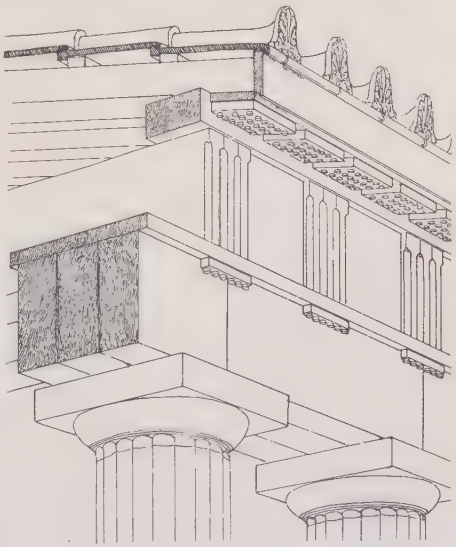


42.—TEMPLE OF APHAEA AT AEGINA.

* Recent researches (1901) have shown that it was dedicated to Aphaea, the Cretan Britomartis mentioned by Pausanias (ii. 30).

Athens, mentioned by Vitruvius, they were probably extremely rare. On the other hand, both in Aegina and at Bassae, Cockerell found blocks of marble which suggested an opaion or some smaller opening in the roof. It has been thought that these may have been provided to light the space between the ceiling and the roof. That space, however, would be amply lighted through the transparent tile slabs with which the roof was covered, and to provide openings in a roof through which the rain would fall on to and deluge the ceiling is not a practical solution of the problem. A block of marble found at Aegina by Cockerell has the appearance of being a coping-stone to an opening of some sort.

With the exception of the tiles and antefixae, none of the timber roof structure of the Heraeum at Olympia has been found. The wide intercolumniation at this early date shows that the architrave was in wood, and the existence of a frieze, with triglyphs and metopes, is suggested by the closer intercolumniation of the columns at each angle, so as to bring the triglyph to the corner.* It becomes necessary therefore, in our research for the design of the Doric entablature, to trust to the earlier reproductions in stone of what were originally wooden features, in tracing their origin and development (Ill. 43). Thus the triglyphs in the frieze reproduce the ends of the beams of the original cella or megaron, or, according to M. Choisy, the decorative features applied, which were secured in their position by pins passing through the projecting lintel surmounting



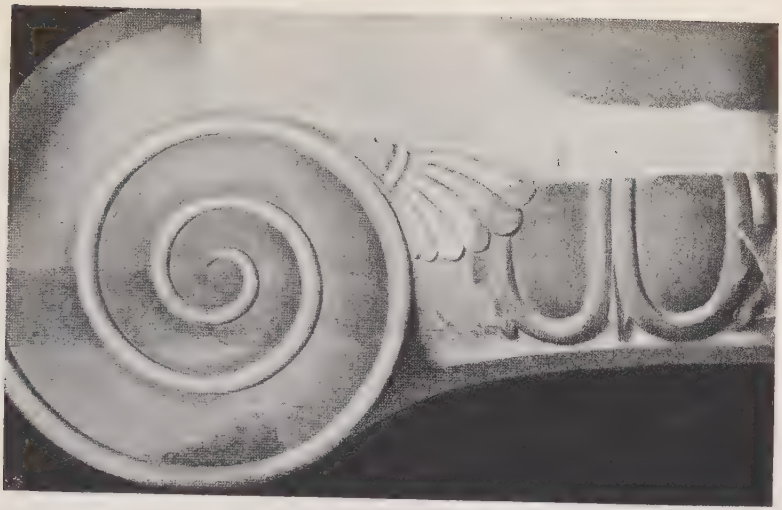
43.—SUGGESTED TIMBER ORIGIN OF THE DORIC ORDER.

* The only instance of a departure from this principle is in the temple of Ceres at Paestum, already referred to.

the architrave or epistyle, which became the guttae, detached from the architrave in the earlier temples, and even sloping outwards as in the temple D at Selinus. The mutules are supposed to be the fascia beneath the sheathing which tied in the rafters of the roof. Whilst the mutules and interspaces still represent the approximate slope of the roof in the peristylar temple, the triglyphs are employed in a decorative sense only, as they do not correspond with the cross beams of the peristyle ceiling which are at a much higher level. The complete independence of the cella and peristyle is best shown in the temple at Segesta, it being doubtful if the cella was ever built.

The roofs of the earlier temples of the seventh and sixth centuries were covered with tiles, but in the temple of Zeus at Olympia the roof was, according to Pausanias, of Pentelic marble "wrought into the shape of tiles."*

* The same author states that "tiles of stone were first made by Byzes, a Naxian," probably in the first half of the sixth century (Pausanias, v. x. 3). Tiles of Parian marble were employed in the Parthenon and in most of the temples in Greece, probably on account of its translucency, which would not only light the space between the roof and the lacunaria on the peristyle, but possibly partly account for the illumination of the interior of the cella, through openings in the framed ceiling, which otherwise was lighted alone through the open door. Some of the earliest examples of these tiles from the roof of the Archaic Temple of Diana at Ephesus (560 B.C.) were found, during the excavations of 1905, in the pockets of the foundations of the later temple.



44.—ARCHAIC EPHESIAN CAPITAL IN THE BRITISH MUSEUM.

CHAPTER III.

THE ARCHAIC PERIOD IN ASIA MINOR.

In changing our vantage-ground from Europe to Asia, we but follow in the footsteps of the Mycenaeans, and the Ionian and Achaian tribes which the migration of the Dorians about 1100 B.C. drove out of the Peloponnesos and part of Central Greece. The Dorians came from the North by way of Thessaly, and after subjugating Southern Greece overflowed towards Crete, Sicily, and South Italy, the expelled Achaians taking the contrary direction and fleeing for the most part to the coasts and isles of Asia. But it may be that these Achaian tribes were, perhaps even without knowing it, returning to their old homes. For, aided by myth and legend, out of the mist of the period long before trustworthy history begins, we can discern faintly the shadowy forms of Asiatic tribes like Primitive Carians, the Leleges and the Ilians, with whom may be classed the Phrygians themselves, who scoured the islands and inland seas and settled the lands we know as Greek, forming themselves the bed of the race of Mycenaean type. There is indeed some ground for accepting the tradition that Mycenae owed its great wealth and the district its superior artistic culture and

further advancement to the fact that it was taken and developed by Pelops, a wealthy king of Phrygia, who made it his seat of government and founded there a dynasty. There are many spots of Asiatic soil where a primitive culture identical with the Mycenaean can be recognised; and in the uncovered remains of Hissarlik, now identified as Troy, there exist the vestiges of earlier seedlings of a civilisation which went before even Mycenae and Tiryns.

A slight sketch of the early history of Asia Minor, obscure as it is, may help us in understanding the genesis of the kingdoms and colonies whose architectural expression forms part of our present subject. For if Greece was the school of the European peoples, it was in the nurseries of Asia Minor, in Phrygia, Mysia, Lycia, and Lydia, that they seem to have been reared. The borderland of Aryan and Semitic man, the threshold of Asia, the gate of the West, the situation of the province of Asia Minor has subjected it more than other lands to the ceaseless strife of races. The dominating powers before the period which concerns us seem to have been successively Hittite, Phrygian, Lydian, the star of empire setting ever farther westward. It was about 716 B.C. that Lydia as a kingdom began to play an independent part. But prior to this time the tribes pressed out of Peloponnesos and Central Greece had fringed the shore of Asia Minor with their colonies, seizing the shore land held of little account by the powers of the interior; so that in the eighth century B.C. Ephesus, Miletus, Smyrna, Erythrae, Halicarnassus, Phocaea, were already great cities, and were rivalling Tyre and Sidon, whose civilisation they were so largely to displace. The swift rise of those Ionian centres is one of the most striking things in the history of the Aegean; it was in great measure from them that the fine arts and philosophy, modified yet invigorated by fresh contact with Oriental types of civilisation, passed back again into European Hellas. Ephesus, "the first city of Asia," may be taken as the type. One of the earliest of the Ionian settlements, it came to be the leader of the confederacy, and was famous for its poets and philosophers, while it possessed great schools of architecture, sculpture, painting, and metal work. Another great centre was the island of Samos, which had a famous school of statuary, to which is accorded the invention of casting in metal. The influence of these cities

upon the interior of Asia seems to have been of little account for some centuries: it was the narrow strip of shore that was magnetised by the greater mass of the interior, and the Achaians parted with many of their characteristics under the new conditions. Lydia's greatest period, about 560 B.C., is connected with the name of its king, Croesus, who tried to ally himself with the Ionian confederation, but neither party was ripe for such a conjunction of aims and resources. For want of this united front the district was conquered (in 546 B.C.) and Sardis captured by Persia, closing the history of the native kingdoms for two hundred years. Yet the fringe of Greek cities retained many of their privileges and still prospered. The proverbial jealousy, and consequent disunion, of the Greeks was the necessary weakness of their independent polity; and even in the Ionian revolt at the beginning of the fifth century B.C. these Asiatic Greeks failed to meet the Persians as a compact and united force, while the rivalry of Miletus and Samos soon afterwards handed them a prey to Darius. It was left to their hardier European kinsmen to throw back the wave of Persian aggression at Marathon and Salamis. From 500 to 404 B.C. they formed part of the Empire League of Athens, which for the space of ten years gave place to Sparta, when the Persian again obtained the upper hand, and decline set in until the advent of Alexander the Great, who in 334 B.C. took them under his protection and made them again of some importance in the Macedonian Empire.

Of the earlier kingdoms which constituted the province out of whom the Greek race may have at the first proceeded, those of Phrygia, Lycia, and Lydia are the most important in their architectural remains. Of the first something has been said already, and the symbol of the Lions' Gate at Mycenæ has been traced to its origin in Phrygia, where rock tombs and monuments show it to be a common design in those parts, though the examples discovered be of later date than that of Mycenae. Another class of Phrygian rock tombs is that which has a square front in one plane, decorated with patterns suitable for a woven fabric, and believed to be a reminiscence of the movable tent—the house of the nomadic tribes. There was thus a tendency in primitive architecture to perpetuate forms which were matured in phases of life preceding those of the erection of durable architectural works. In Lycia we meet

with a parallel class of rock tombs, that of the wooden hut sculptured in the rock, with all its beams and poles, its mortices and pegs—an imitation so close as to be unmistakable. At Myra, the ancient capital, there is an imposing group on the mountain side of these cliff dwellings of the dead. Yet another class of monuments is met with in Lycia, the sarcophagus, of which two of the best examples rest in the British Museum, and these are not less surely wooden in their origin—at least, so far as regards their upper parts—though they are probably of much later date. The upright posts and framing; the end pieces, fixed by a wood key; the checking down of the cross beams; the ceiling joists appearing at the sides, but not at the ends; the planking of the roof: every detail represents wood construction perfectly, and the whole effect is that of a wooden cover to a stone-sculptured sarcophagus; yet it is all of stone. It is worth noting, too, that it appears to represent ship rather than hut construction; and this not unnaturally, for Lycia fringed the south coast of Asia Minor, and the Lycians were a seafaring people. A boat turned upside down on the beach might have suggested the upper part. The opening was doubtless for the introduction of the body. The reliefs and the inscriptions are of doubtful interpretation. Here on the roof is the suggestion of the origin of the Greek dentils, and it will be seen how similar in many ways was the treatment of the cornice in the island of Cyprus (Ill. 47, p. 59), which lies right off the coast of Lycia, and which combines in a singular way the characteristics of Egyptian, Phoenician, and Lycian art.

The reason why it is essential in studying architecture to have some regard for the broader views of history, religion, and society is that purpose, the intention and destination of the building, is the greatest controlling factor in shaping it, the most important of all determining forces in the development of the structure. For example, it is really of greater importance in the evolution of Greek architecture that the Greeks devised shrines to house their gods and goddesses, and for the needs of their particular ceremonies, than that marble was the building material which lay close to hand. Material is, of course, another influence, but a decidedly minor one. Temples were built of marble at Athens, and of limestone at Paestum and Corinth, the only effect upon the design being

a greater refinement of detail at Athens: the type is one and the same.

It is extremely probable that the earliest covering which the Greek image, or xoanon, had was little more than a hut which served the material purpose of shelter. But it was not in the nature of the Greek to be satisfied with this, and it was necessary to give the tabernacle the character and spiritual significance of a god's house. Mere advances in construction do not account for the development of the shrine: it is of the aspiration of humanity towards something fulfilling their ideal of a house of God that the Greek temples speak. Building better than they wot of, one generation joined hands with another to rear these most splendid fabrics of in-dwelling divinity. In nothing more than in religious buildings does architecture point out more clearly the pathway of the spirit, the slow and painful ascent of "the world's great altar stairs that lead through darkness unto God."

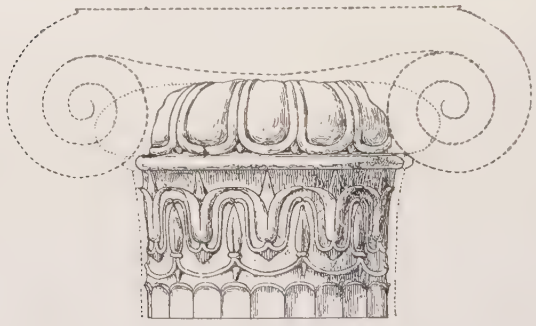
There exists in Greek religion a combination of the personification of natural phenomena with that of deified heroes or ancestor-worship, and the earliest records of the primitive European Greek religion point to a worship of *Zeus*, the supreme God. The Phrygians in Asia Minor, on the other hand, appear to have come of a race to whom marriage was unknown, and all descent traced through the mother. Cybele was their great goddess—the mother of gods, the patroness of all fertility. When the Achaian Greeks went over again to Ionia in Asia Minor, they took with them their new cult of a Supreme Mother, and the two beliefs appear to have mingled. But already the number of the Greek gods had rapidly multiplied and become legion: they had married and begot offspring innumerable, and in the different localities the ingenuity of the priesthood determined the special worship of a certain god or gods, without regard to that of their kinsmen. In some such way it came to be that the favourite dwelling-place of *Zeus* was supposed to be at Olympia, of Hera at Samos or Argos, of Athena at Athens. *Zeus*, Athena, and Apollo may be instanced as constituting the greatest triad of the Greek gods, each embodying to the Greek mind one of the forces of Nature. *Zeus* was ruler of earth and heaven, the god producing storms, darkness, and rain; Apollo was the "shining one," the sun-god; Athena the queen of the air, worshipped at

Athens as Pallas-Athena, the goddess of wisdom, and in a variety of other aspects. Then there were Demeter, the goddess of agriculture; Poseidon or Neptune, the sea-god; Hephaestos or Vulcan, the god of fire; Hermes, the messenger and herald of the gods. These examples will be sufficient, for it would be impossible to do more than give a general idea of the nature of Greek mythology, which was largely the idealisation of God's mysterious workings by people who in spite of, or because of, their healthy animation were full of sensitive and earnest imagination. Keenly susceptible to the permanence of spirit-life in Nature, beautiful scenery affected the Greeks in a religious way, and to them the mountain, the water, and the wood were peopled with divinities. If landscape touched them at all artistically, at least it did not lead them to pictorial representations, but solely to this personation and deification. Numbers of cults in addition were created out of admiration for the prowess displayed by heroes of the same clay as themselves, and, as in modern days, honours were paid them and pilgrimages made to their shrines. As a rule temples dedicated to gods had the statue looking eastward, and therefore the principal entrance faced east, while those of the heroes faced westward. The dedication of the temples cannot be made out from their style alone, nor even in many cases from the subjects of the sculptures which have been spared; but the temples of Zeus, Athena, and Hera were invariably Doric, while the Ionic was used in those of Apollo, Artemis, and Dionysus. This, however, arises largely from the worship of particular gods in localities peculiar to one tribe or the other. All the great temples, besides the portico, had a vestibule (pronaos); a large habitation (naos) for the idol, which was placed so as to face the entrance; sometimes a chamber in the rear (opisthodomus) used as the treasury of the priesthood, and the epinaos enclosed with bronze gates and used for the same purpose. The portico of each temple was provided with a stoup containing water consecrated by dipping a burning stick from the altar, and with the water from it all who entered to take part in the sacrifices were sprinkled. The pronaos and epinaos frequently housed images and votive offerings, serving the purposes of the treasury, and were enclosed by a metal railing and gate. The altar, which in early times stood in the open air, continued to be placed in

front of the temple in the open, while in the interior a smaller altar stood in front of the image. These altars (round or oblong in shape) were built of stone or marble raised on steps, with appropriate inscriptions, and were decked with flowers. It is possible that in most cases the interior of the temple was open to privileged persons only, and that the one view which the people had of the god (except perhaps at festivals) was from the open doorway, to the east, at sunrise, when the light would dimly illuminate the great statue: and one can under such circumstances have some idea of the awe and sense of mystery inspired among them by such a view of the image of Zeus or Athena. On the occasion of festivals or processions, the excitement of the moment could be counted on to neutralise the contempt which greater familiarity with the lifeless symbol might inspire.

With some slight idea before us of the racial, historic, and social relationship of the Ionian Greeks, and of the purpose of the temple shrines, it may be useful now to turn to the more technical side of the development of the material fabric. The Ionic order, using the well-worn phrase in its widest sense, has been placed after the Doric in our scheme, not because it can be regarded as later, but to emphasise the fact that its development was co-extensive in time, and that it was not a form which replaced the Dorian style. Rather, as we shall afterwards see, they may both come out of the same root in the soil of Mycenae. In the lands occupied by Dorians the Doric order was the first to make its appearance, and was almost exclusively used, while on the coasts of the Ionians and kindred tribes we do not seem to have Doric buildings till a late period, when they do indeed occasionally appear, although the Ionic predominates. Hence the differing treatment became a symbol of the two greatest divisions of the Greek race, whose rivalry makes the history of Greece, and the happiest and most expressive symbol we could have, speaking to us, on the one hand, of the grave, severe, all-sufficient Spartan, in whom Dorian culture approached its ideal, and, on the other of the lighter, more versatile, frivolous, and superstitious semi-Asiatic colonist who stands for the type of the Ionian race farthest removed from the Dorian. The characteristics of the order are by no means summed up in the Ionic capital, nor even in the column itself; but it is natural to deal first with what has

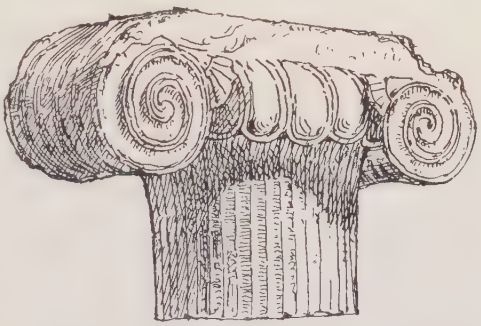
always been regarded as the index mark of the style, the obviously reasonable position being that not one cause, but many, operated to produce the graceful and ornamental form.



45.—CAPITAL FROM THE TEMPLE OF APOLLO AT NAUCRATIS.

Few, if any, architectural features can be attributed to one cause alone, but to a combination of them. One thing seems plain, that the farther we go back in our study of the Greek Ionic order the more probable appears the theory of a wooden origin—the spirals being painted or scratched on to the block which distributed the load—and the archaic spirals recently discovered at Athens, and now in the Museum of the Acropolis, would all seem to bear out the theory, being simple masses or blocks with the spiral traced or painted on. In some of the early Ionic capitals the volute and the echinus moulding are carved out of different blocks, the latter, exemplified in the capital of the archaic temple at Samos, being, in fact, the crowning moulding of the shaft, and carved out of the upper drum of same. In later developments the echinus is partially sunk in the cushion of the volute, as is the case with the capital now in the British Museum which belonged to the archaic temple of Diana at Ephesus (Ill. 44, p. 49). In this case the bead only is carved out of the shaft block. The illustration of this capital shows the undeveloped nature of the spiral bead of the volute, of the palmette ornament which marks the junction of the volute and the echinus, and of the carved egg and tongue. The peculiar design of the latter, however, and the fact that its upper portion recedes, suggests a different origin from that hitherto assumed—viz., that the ornament, which in the Doric capital was painted, in the Ionic was carved. The earliest example of the Ionic capital known (620 B.C.) is that which was found at Naucratis by Prof. Flinders Petrie (Ill. 45), and ascribed to Aahmes II. (Amasis), who allied himself

with the Greeks, and granted them special religious and commercial privileges. The crowning feature of the shaft consists of a moulding which is carved to represent the overhanging leaves or petals of some plant. In this capital, and also in the Ephesus example, a bead runs under this moulding, but in the capital of the Naxian votive column at Delphi (Ill. 46) there is a deep cavetto which still recalls the original *motif*. The same is found in two early capitals in the Museum at Athens. Although possibly of later date, the capital found by Cockerell at Delphi* represents the original complete design. In the course of development the upper portion of the carved echinus in the Ephesus and the Naxian capitals has been cut off, but in the example from Naucratis the leaves are carved on the upper surface and die into the horizontal bed which carried the volute. The first transition from the original overhanging leaves is shown in the Ephesus capital, the second in that of the later temple, or in still greater purity of design in the capitals of the temple of the Ilissus (Ill. 66, p. 83) and the Erechtheum. The pendant leaf, however, is found in numerous other examples, as in the Neandrian capital and the example found at Aegae, and it decorates the upper torus moulding of the lower drum of the archaic temple at Ephesus (Ill. 49). In a more elongated form it is found in the examples at Persepolis.† The capital found at Naucratis is interesting in other ways: the upper part of the shaft is slightly bell-shaped, it is



46.—CAPITAL OF NAXIAN VOTIVE COLUMN AT DELPHI.

* See "Orders of Architecture," Fig. 8, page 8.

† The great Hall at Persepolis, in which the columns are found decorated with the Ionic volutes placed vertically and the calix with pendant leaves, was not built till 485 B.C., seventy years later than the archaic examples from Ephesus and Naucratis, so that these features, assumed to have been the models for the Greek capitals, were in reality copied from them. The architects of the great Hall of Xerxes, besides other treasures, would seem to have utilised the Ionic capitals of the archaic temples of Miletus or Samos, and copied them into their design to decorate their own columns. They are not found in any of Darius's work.

increased in diameter as it rises,* and it is decorated with the lotus flower and bud, which may have been the prototype of the well-known anthemion or honeysuckle. The upper part of the flutes also terminates in a slightly projecting leaf. The same treatment is found in a much later example—viz., in the capital of the Monument of Lysicrates. Returning to the archaic capital from Ephesus, the most remarkable feature is the great length and narrowness of the thin slab forming the abacus, an oblong almost twice its width, instead of the square form to which the later examples have accustomed us. The effect is that of a bracket-capital intended to lessen the bearing of the epistyle between the columns, and the side elevation of the capital has little of the cushion or bolster shape which afterwards it assumes.

In the capitals found at Neandria, Lesbos, Trapeza in Cyprus, Mytilene and Kolumdado (Napé) in the Isle of Lesbos, the spiral of the volute rises from the centre of the capital, as in the Cyprian examples already referred to, and their constructive value as bracket-capitals is so much less marked as to leave no doubt that the Greek Ionic capital in its origin was constructional, whereas the Cyprian and the Assyrian were only decorative. This is clearly shown in the illustration from Cyprus, where it decorated the side of the door-jamb of a tomb (Ill. 47).

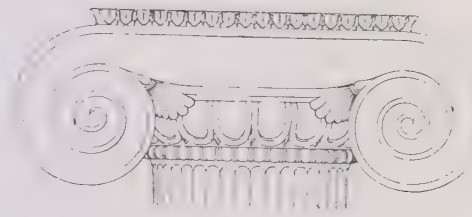
The Ionic shaft always appears to have had a proportion widely different from its step-sister the Doric. Its work was less; the whole design of the Ionic temple was lighter and more delicate, particularly the entablature which it had to carry; and it may be accepted as a principle of those early architects that the strength of columns was determined by what they had to carry. In this way it came about that the Ionic column assumed a proportion of eight to nine diameters high, while the Doric amounted to four or five only. In proportion to the weight of the entablature which each carried there is, however, no great disparity of strength or efficiency. Like everything else, the flutings of the Ionic order became more delicate; cut deeper, they could not so well preserve the sharp edge, and a narrow fillet of the rounded surface of the column was preserved, concave and very slightly convex surfaces contrasting over the whole of the shaft. In the earlier examples of

* The same characteristic is found in the Naxian column and in that at Ephesus.

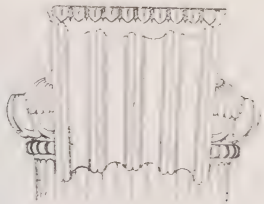
the Ionic column there are no fillets between the flutes, which are very slightly curved, and instead of the normal number of flutes—twenty-four—which are found in the fully developed examples, there are forty in the Naucratis and Ephesus shafts, and forty-four in the Naxian column.

The lower drum of the early column from Ephesus (Ill. 48), with its archaic sculpture, has been put together in the British Museum, and it shows that the later Ephesian temple derived from the earlier or archaic one the idea of sculptured drum bases for its columns. This is a peculiarity confined to Ephesus, as far as is known; but one of the most distinctive marks of the Ionic style is the character of the base. The Doric base was the continuous stylobate into which the flat mill-stone bases were merged. But the more slender Ionic column required a base for greater effect of stability, while it admitted of one by its wider intercolumniation. The Ionian base consists normally of a large torus elevated on a horizontally fluted disc. The large scotia below seems, however, to be a Greek addition, another indication of the Greek sense of the necessity of transition. While the base remained of this form, it was usually constructed in one piece with the upper step of the stylobate, for otherwise too great strain might have been thrown on the delicate lowest member. Much variety exists in the drawing of this type; but the ultimate form, the "Attic base," was reached

47.—VOLUTE OF TOMB AT TAMOSSOS, IN CYPRUS.



FRONT



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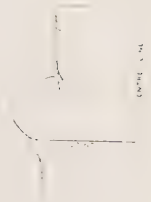

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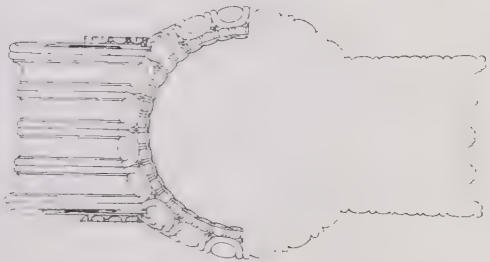


HALF PLAN LOOKING UPWARD

HALF PLAN THROUGH VOLUTE

CAPITAL AND BASE
FROM THE
ARCHAIC TEMPLE OF DIANA AT EPHESUS

CONJECTURAL RESTORATION
OF COLUMN

J. Cromar Watt, del.

48. CAPITAL AND BASE FROM THE ARCHAIC TEMPLE OF DIANA AT EPHESUS.

by the addition of a lower torus, gradually increased in size till it became somewhat larger than the upper one.

The function of the column was to carry the entablature, which has features of its own. The architrave, instead of the high plain face of the Doric, is like that of the tomb and palace of Darius, triply divided and stepped, each face projecting slightly over the one underneath. It is usually from two-thirds to three-quarters of the column's lower diameter in height, and is terminated normally by a cyma-reversa and an astragal.

The frieze—a space of about the same height, an intermediate member—is a Hellenic creation, oriental entablatures consisting only of the two parts, the beam and the cornice; and it became in the Ionic style a continuous decoration of carving, usually of figures grouped in some processional relation. The cornice is a plain projection, supported and terminated by a cymatium. The dentils which appear in Asiatic examples, and which represent the ends of ceiling joists, form the under-part of the cornice; but the actual stone beams of the ceiling rest directly on the architrave, so that in the examples which we are able to reconstruct they are as far below the objects which seem to represent them on the exterior, as the Doric beams are above the triglyph. A good example of the proper relation of Ionic and Doric architraves and ceiling is afforded by the section through the Propylaea (Ill. 53, p. 70). Between the beams the ceiling is panelled, not in small coffers, as in the Doric, but in large panels stepped in broad surfaces and relying mainly on colour for their effect. The antae-capital and the wall of the cella are in the European examples richly moulded, and plain except for a band of ornament underneath, terminated by a neck moulding. In Asia Minor the form taken by the antae-capital has been likened to a sofa, and is decorated with wreaths, stems, and animals. The form is closely allied to several capitals found in Cyprus and believed to be of Phoenician character.

The chief defect of the Ionic order lies in the angle capital, which, owing to the necessity for making the volutes face in two directions, loses its structural significance and individual beauty. The capital seems to have been designed for the portico-in-antis. Its use in a peristyle or a peristylar building leads to difficulties. With a single round column at the angle, no other solution was possible than to bend angle-wise on plan the volutes which meet at the external corner; in other

words, to unite and turn aside the useless parts of the bracket (Ill. 65, p. 82).* There are two examples, however, in which the Greek architect frankly faced the difficulties, and in the interior of the temple at Bassae and the stage of the theatre of Epidaurus the volutes are bent anglewise at the four corners of the capital. In both of these cases, however, the column was not an isolated support, but was attached to a pilaster at the back, as at Bassae, or semi-detached as in Epidaurus. At a later period, in Pompeii, we find an Ionic capital with the volutes canted at each angle, but with far less projection of the volutes than is found in the ordinary type of Greek or Roman Ionic capitals, so that it virtually constitutes a new design, and, from the beauty of the line of the spiral, is probably due to Greek workmen.

The art of figure sculpture, however valuable in itself, or as an architectural accessory, can never again have the same spontaneity as it possessed in living Greece. The origin of the art in Greece was without doubt religious; it was in the fashioning of idols that sculpture grew and flourished. The earlier gods were carved in wood, and down to a later day, while the buildings are marble, the great chryselephantine images of Zeus, and Athena, and Poseidon were in wood, albeit overlaid with gold and ivory. The beautiful material which Naxos, Paros, and Mount Pentelicus yielded could not, however, long be ignored. As far back as we can trace the Archaic temple, so far do we trace its accompaniment of votive offerings, marble statues of the god, or of the donor, who thus dedicates himself symbolically to its service. The countless gods of the Greeks, their symbolic meaning, their attributes, their history, and their achievements, had all to be expressed through the medium of sculpture, their figures surrounded by votive offerings, and the buildings dedicated to them to be in this way decorated and furnished, and so a wide field was opened to the artist, and a magnificent opportunity given to the development of the art. Earth and sea and sky, mountain rocks and valleys, rivers, groves and forests, which the Pantheism of the Greeks personified and idealised, had to be represented in sculptural form. But

* Mr. Henderson, however, in his conjectural restoration of the archaic temple at Ephesus shows, that for the internal angle the complete curve of the volute is preserved, instead of being cut in half, as in the capital of the Erechtheum, and this suggests an earlier origin to that which on page 82 was pronounced to be an unsatisfactory solution of the problem.

while the simulacra of the deities, the wood and clay idols, are the germ of the Greek marble figures of the gods, the development of their form is not to be traced apart from circumstances which greatly complicate it. The pre-existing phase of sculpture in Egypt and the contemporary developments in Assyria may possibly have had some influence. On the other hand, the tendency of modern research is leading to a different conclusion, and although in the Greek sculpture of the historical period it is not possible to trace, according to Professor E. A. Gardner,* any direct inheritance from the coloured reliefs or the paintings at Cnossus, or from the Vaphio cups and the Tiryns fresco, they offer a singular analogy to the coloured reliefs found in Athens and supposed to have decorated the pediment of the earlier Parthenon. It is possible, therefore, that there may have survived some artistic traditions which preserved some of the distinctive features of the old decorative work. A remarkable series of sculptures recently discovered at Athens, and of earlier date than 480 B.C., points to a very high degree of elaboration and refinement in the treatment of accessories, and shows that the work of Phidias and his contemporaries which succeeded may almost be described as a Doric reaction. A conventional treatment of hair and beard, a meaningless and expressionless smile, elaborate drapery, narrow thighs, and other thin proportions, characterise the Ionic-Archaic style. The simplicity of line must often be set down to the architectural purpose, and to such tradition, partially cast off, much of the sculpture of the fifth century B.C. owes its charm.

At this point a recapitulation may be made of the points brought out in the last three chapters, which are but the introduction to the best of Greek art—the excavator's work, so to speak, though the foundation has also been laid. At Mycenae and Tiryns in Argolis, at Orchomenos in Boeotia, at Troy in Mysia, at Lycia opposite Cyprus, we see a phase of architectural history expressing itself either in wood construction or in the copying of timber forms in stone, especially in tomb architecture, whether in tumulus, rock-cut hut, or sarcophagus. We see it at Mycenae rise to a very high degree of taste and skill and beauty, but cut short by the Dorian invasion and the dispersion of the tribes which

* *A Handbook to Greek Sculpture*, by Ernest Arthur Gardner. Macmillan, 1905.

produced it. Yet it was in part the same people who gave rise to those great Ionian cities, Ephesus, Miletus, Rhodes, Sardis, and Priene, which are only now being recovered by explorers, and with them to that phase of culture known as Archaic Ionian, of which the details from the early Temple of Diana give the best notion. It is at this early period that the structural development of the style is completed; the genius of subsequent architects through centuries was altogether directed to a refining and modifying process, to a close study of every possible elegance and polish consistent with quiet and sound taste, to the obliteration of every crude line, harsh angle, or unseemly form. In such ways they reached the perfection of the Temple of Nike Apteros and of the Propylaea, which were not so much the works of their particular architects as the matured fruit of a succession of harvests: the result, as we see now, of the dispersion to Asia, of the atmosphere which the Asiatic colonist breathed, and of the Archaic temples to the Mother-god of the Phrygian people, whether in the guise of Artemis or of Cybele. Yet who would affirm that the Greeks were automatons working out unconsciously a line of development, following blindly a predestined course? If ever architects thought or planned or designed with true originality, they were the Greeks. But it was the conservatism, the traditionalism, of the style which, after its constructive form was fixed, gave us such masterpieces as the Parthenon, the Propylaea, and the Erechtheum, the perfection of which would have been impossible but for the careful and logical progression of the two preceding centuries.

Architecture in this view must be regarded as a natural growth largely beyond control. A man may add to it or take away from it; he becomes a slave to its logical principles, or asserts his free will in refusing tradition and does his little day's work outside the movement.

In what way to use tradition is the problem of modern architecture, for there is this difference now. In those days an architect's retrospect was bounded by the works of his grandfather, or at most the primitive arts of his own district: now it ranges over the larger tradition of all architectural history, choosing the good and refusing the bad, and no doubt, if we but keep in touch with Nature, out of this selective use will come in the fulness of time a living art as noble as Greek, more cosmopolitan than Roman and perfectly characteristic of the age we live in.

49.—GROUP OF THE FATES FROM THE PARTHENON AT ATHENS.

CHAPTER IV.

THE CULMINATION IN ATHENS.

As we have already pointed out in the preceding chapter, during the period described as Archaic Greek the structural development of the style was completed, no great constructive improvements showing themselves after about 500 B.C. The next two centuries would seem to have been chiefly directed to the beautifying and refining of the constructive features already prescribed: and it was in fact a conservative adherence to the older type, and a traditional respect for previous result, which led them ultimately to the production of such masterpieces as the Parthenon and the Erechtheum, the perfection of which would have been impossible but for the careful and logical progression of preceding centuries.

The Acropolis of Athens, within whose circuit so much of what was greatest in Greek art was contained, was originally one of the primitive citadels of Mycenaean character. Discoveries in the district round Athens have revealed rock-cut tombs and the same tendencies in design in fictile and jewel art which point to its occupancy as a civilised centre at a date between 1500 to 1200 B.C.; and in the Acropolis itself, on the site of the earlier Parthenon destroyed by the Persians, have been found what are thought to be the remains of an early Mycenaean palace. The Dorian intrusion, however, cannot

be regarded as having upon Athens the same effect of shock and displacement that it had in Mycenae, for we know that many of the expatriated Mycenaeans took refuge in Attica instead of joining those who set sail for Ionia. The complete overthrow of a city as a civilisation has frequently resulted in its preservation for posterity, whilst its gentler supersession brings about its irretrievable disappearance. The cities of Nineveh, Mycenae, and Pompeii bear out the truth of the first alternative, while every city that has retained her population has to some extent submerged its history in so far as that is written in stone. So it comes to pass that we can read the story of the prehistoric age, all-important in the evolution of Greek art, chiefly by the buried cities of the Peloponnesos, while in Athens its vestiges are few indeed.

It has been said that behind and beyond any cause that we can specify for a development in art and in civilisation itself there is an economic one, and the theory may be applied to the culmination of Greek art. That a great period in art production should arise there must be a certain over-production and accumulation of wealth, which may be said to find an outlet in the various channels which architecture and art supply. In this view of it we trace the Egyptian monuments to the wealth of the kings, the architecture of Rome to the spoil of the world, and in like manner find an explanation in an economic sense of the Grecian central period, the age of Pericles. The wars with Persia had enriched Greece, and the naval supremacy of Athens, displayed most of all in the battle of Salamis, had raised her to a position of the greatest influence among Grecian cities: so that when the Persians were driven out of Greece many of the islands and the coast cities of Thrace and Asia Minor effected an alliance, with Athens at their head, permanently to keep the Persians out of all Greek lands. Athens, gradually assuming greater authority, practically came to treat them as subject cities, exacting tribute; and thus riches, talent, and power passed from them into the capital of the hegemony. It was about this time that she, under the leadership of Pericles, took the greatest and proudest place among great cities, built her most beautiful temples, and brought forth her greatest artists, and it is the artistic work of this period, which in its beauty reaches its culminating point of perfection together with all else which was greatest in its history, that we have now to study.

Yet the wonders of the Periclean age would have been impossible but for the great artists to whom this over-production had afforded opportunity for the exercise of skill down a long line of Greek artistic tradition, and for the works of art that had been preparing the way in Greece, but especially in the colonies of Asia Minor. The reflex influence of these Ionian settlements upon the mother country can hardly be over-estimated in considering all the causes of the culmination. For, as has been already indicated, Athens was an Ionian city from early days, and was influenced largely by, and had much commerce with the colonists of Asia Minor. But, besides this domestic influence, there was one at work almost equally powerful in the development of Doric principles and manners in the Peloponnesos, by which Athens, if by nothing else than her situation, must have been moulded, and under whose influence she now came more directly. Leader of Ionians on Grecian motherland, she could not escape the influence of her neighbours at Olympia, for example. Hence it came to be, by an irony of fate, that her greatest temple and her most popular monument, the Propylaea, were in the Dorian style, and partly decorated by Peloponnesian artists, though they might be in many respects different from the Doric works elsewhere. Or was it that she strove to show that the Doric style itself could only attain its perfection on Attic soil? The cleavage of its styles with the character of the population is quite marked in every place but Attica. The Doric prevails over Sicily and South Italy and the Peloponnesos, where the Dorians predominated, so that only one or two purely Ionic remains have there been discovered; while the temples of Athena at Assos and Pergamum are perhaps the only Greek Doric works in Ionian territory outside Athens.

Of the great architects and sculptors of this period we know at least the names, and can identify some of the works. Among these is Ictinus, the architect of the Parthenon, which he made the subject of a book, unfortunately lost, but mentioned by Vitruvius. This architect also designed the temple of Apollo at Bassae, near Phigalia, a work which, though it does not exhibit all the grace of the Parthenon, is of refined and remarkably advanced character, and heralds an archaistic tendency. Like the Propylaea (and the Parthenon in lesser degree), it embraces Ionic and Doric principles, as well as their

distinctive features. Ictinus was assisted in his Parthenon work by Callicrates, of whom less is known, while the name of Mnesicles has come down to us as the creator of the Propylaea, which, as will afterwards appear, he did not leave complete or as he had intended it. Besides these, Phidias, king of sculptors, must have an honoured place. This Athenian, at the time of the erection of the Parthenon, already enjoyed a great fame throughout Greece, and he was able to command talent of the most distinguished order for the work, for it is not to be supposed that he executed all of it with his own hands. The designs of the pediments and the friezes, and the subjects of the metopes, were all doubtless of his conception, and executed

50.—THE EAST FRONT OF THE PARTHENON AT ATHENS.

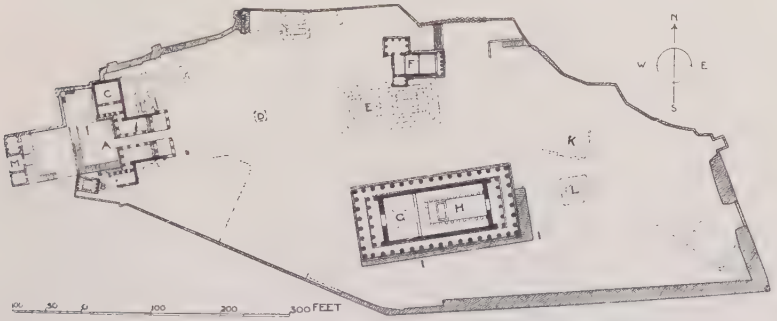
under his control. Like Polygnotus, the painter of the Pinacotheca, he worked at the Parthenon without pay, the other sculptors being paid one or two shillings a day. Among the greatest works of Phidias was the bronze statue of Athena of Lemnos in the Acropolis, and the colossal statue of Athena Promachos, made of Persian spoil, which stood between the Erechtheum and the Propylaea, and whose gilded helmet, crest, and spear-point gleamed thirty feet high, a landmark for sailors far at sea. In addition to these, there was also the world's wonder of the Pan-Hellenic Zeus at Olympia, and the figure of Athena in the Hecatompedos of the Parthenon at Athens.

It is on the Acropolis of Athens that we may best study the works of the culminating period, and it seems the simplest way

51. THE ACROPOLIS AT ATHENS FROM THE SOUTH-WEST.

to make the tour of the monuments as they stand, because, whilst they may not appear in strictly chronological order, they are yet substantially of one age and type, and are so far part of our scheme in that each building was planned and designed in relation to those existing.

"There is only one access to the Acropolis," says Pausanias, "no other is practicable, as the hill rises abruptly on all sides and is fortified with a strong wall." This entrance is supposed by Penrose to have been through two gates at the foot of the substructure carrying the Temple of Nike Apteros. Shortly after Pausanias's visit, at probably about 161 A.D., a new entrance was made in front of the Propylaea, discovered by



52.—PLAN OF THE ACROPOLIS AT ATHENS.

A. The Propylaea.
B. Temple of Nike Apteros.
C. Pinacotheca.
D. Site of Statue of Athena Promachos.
E. The Ancient Parthenon.
F. The Erechtheum.
G. H. The Parthenon { The Opisthodomus or Treasury. The Hecatompedos or Naos.
I. I. Substructure of Cimon.
K. Altar of Athena.
L. Temple of Roma and Augustus.
M. Beulé Gate.

Beulé in 1852. This was built with material taken from the choragic monument of Nikias, a Doric hexastyle portico which existed under the walls at the south-west end, and which was probably taken down to leave space for a road up to the Acropolis behind the new theatre of Herodes Atticus. On the eastern side of the new gateway was a flight of steps seventy-five feet wide, also of Roman work, leading up to the rock-cut roadway which winds up to the central intercolumniation of the Propylaea, and was intended for chariots in a procession or for the beasts of sacrifice. On either side of this roadway were flights of marble steps, whose original position can be traced on the plinth of a lofty pedestal on the north side which carried a statue of Agrippa. These led to the stylobate, on which

rested the Doric hexastyle portico of the Propylaea (a term given to the whole pile, including the vestibules before and behind, and the cross wall pierced with five doorways), with columns twenty-nine feet high and five feet diameter. The central intercolumniation was much wider than the others, and in its frieze occupied the width of three metopes. The depth of the vestibule behind this portico was about three-quarters of its width, and its marble ceiling* was carried by a row of three Ionic columns (33·6 feet in height), on each side of the central roadway. The slender character of the

53.—SECTION OF THE PROPYLAEA AT ATHENS (RESTORED).

Ionic order enabled its height to exceed that of the Doric column, whilst allowing of a far smaller diameter of the base (Ill. 53). The cross wall beyond was pierced with five doorways, which corresponded in axis and width with the intercolumniation of the main front. On the eastern side of this cross wall was a similar hexastyle portico, facing the east, at a slightly higher level, owing to the rise in the ground (Ill. 54). On the left-hand side of the main front is a small building called the Pinacotheca, from the fact that Pausanias alludes to the paintings he saw in it. It forms a side wing to

* This seems to have attracted Pausanias's attention, as he says: "The Propylaea has a roof of white marble, and the size and beauty of the works were remarkable even when I saw it."

54. THE PROPYLAEA OF THE ACROPOLIS AT ATHENS, THE EAST FRONT.

the Propylaea, from which it is entered through a portico-in-antis of three Doric columns. The antae at the north-east angle of this building and on the west side of the wall of the eastern portico suggest that it was the intention of the architect to add further structures, which would virtually have faced the whole west part of the Acropolis. The curtailment of Mnesicles's design is evident on the south side, where the wing which should have corresponded to the Pinacotheca stops short at the old Pelasgic wall on a site which apparently formed part of the Sanctuary of Artemis Brauronia, and was therefore opposed by the priests of that goddess. For a similar reason

55.—THE TEMPLE OF NIKE APTEROS AT ATHENS.

the projection of this southern wing westwards was curtailed owing to the site being occupied by the temple of Nike Apteros, which crowns the bastion on the south-east side, and which would seem to have been built on the site of an earlier temple or altar. This temple disappeared for a time, having been taken down and utilised in the erection of a central bastion by the Turks. On the destruction of this in 1834, the temple was rebuilt in 1835 (Ill. 55). Since that date some of the sculptured slabs which formed a balustrade along the north side of the temple were discovered, and these rank amongst the most beautiful sculptures of the periods. The temple itself, built of Pentelic marble, is of the Ionic order, amphiprostyle

and tetrastyle—that is to say, it has porticoes of four columns each towards the east and west. Its axis, nearly due east and west, forms an angle with that of the Propylaea, and as its north side is built on an ancient Pelasgic wall we may assume that it occupies the site of an earlier temple or altar.

Passing through the Propylaea, and about one hundred and twenty feet beyond it, stood the great statue of Athena Promachos, which is shown in the restoration by Lambert (Ill. 56), and about one hundred feet further the ancient temple of Athena, destroyed by the Persians, the materials of which were utilised in rebuilding the northern walls of the Acropolis. In order to give great prominence to the new Parthenon, a fresh site to the south was selected, the walls of the south side of the Acropolis were extended beyond the old Pelasgian fortifications, and by forming a lofty platform a greater height was given to the new temple. The discoveries of later years have shown that the foundation of the first structure (I. I. Ill. 52), due to Cimon, projected a temple of greater length and less width, the foundation extending about thirteen feet to the east of the lower step of the actual Parthenon, and being about eleven feet short of the north-east lower step. This is, however, not the only archaeological discovery made of late. The plan of the Parthenon shows two distinct chambers, the cella proper with its pronaos facing the east; and what is called the opisthodomus (G), or rear building, with its epinaos facing the west. The term Parthenon given to the whole building is, according to Dr. Dörpfeld, a later title, and was confined at first to the opisthodomus, which was called the Parthenon (chamber of the Virgin), to distinguish it from the Opisthodomus or Treasury of the ancient temple of Athena, to which we have already referred; and the cella was known as the Naos hecatompedos (H), or cella of one hundred feet, being the length of the cella of the older Parthenon, as also that of the width of the stylobate, viz., one hundred Attic feet.

Keeping to the better known title, the ceiling of the Opisthodomus or Treasury was probably carried by four Ionic columns, traces of the bases of which have been found on the pavement, for the same reason given for those in the Propylaea, as occupying less floor space and being sufficient to carry the weight of the ceiling. In the cella there were ten columns on either side, and three columns at the west

There is no authority for the circular building shown here.—
R. P. S.

56. THE ACROPOLIS AT ATHENS AS RESTORED BY M. LAMBERT.

end. These are considered to have carried an architrave with superposed columns above, as in the temple of Paestum already referred to. The primary object of these columns would seem to have been the support of the beams of the ceiling or roof. The three columns at the west end show that the aisle was carried round the interior of the cella, with bronze barriers fixed between the columns, so as to allow privileged travellers like Pausanias to walk round the chryselephantine statue of Athena and see it on all sides. A similar arrangement existed in the temple of Zeus at Olympia, except that there were no columns at the west end, a space being left at the back of the pedestal to pass round. Here the barriers consisted of vertical stone slabs, portions of which still exist.

57.—METOPE OF THE PARTHENON: CONTEST OF CENTAUR AND LAPITH (BRITISH MUSEUM).

Before passing to the exterior a few words should be said about the chryselephantine statue of Athena, Phidias's masterpiece. This was constructed on a wooden core, having ivory for the face, feet, and hands, and gold for the drapery ground and accessories. Its position, standing well out in the central portion of the cella, is known from the traces of its pedestal on the pavement. The total height of the statue and its pedestal was twenty-six cubits (close upon forty feet), and from the account of it given by Pausanias (Bk. 1, Ch. 24), the nearest resemblance to it is found in a statuette discovered near the Varvakeion Gymnasium in Athens in 1880, and now in the Central Museum, though in minor details it differs somewhat from the description. We have already referred to the greater prominence given to the Parthenon by its erection on the south side of the Acropolis on a lofty platform. This not only made it the principal crowning feature of the Acropolis as seen from the south and west, but on the Acropolis itself rendered it by far the most imposing structure there, so that it was worthy of the various subtleties both in line and

proportion which it was to receive at the hands of Ictinus and Callicrates, the architects, and of its enrichment by Phidias with the most beautiful sculpture which the world has seen. Whilst the cella and the treasury have lost all of their decorative elements, there fortunately remains sufficient of the exterior (Ill. 58) not only to restore it more or less completely in our imagination, but to have enabled Penrose to measure mathematically those subtle refinements both in design and construction which make it the most remarkable building in the world. In speaking of these refinements Professor Percy Gardner says* : "The whole building is constructed, so to speak, on a subjective rather than an objective basis; it is intended not to be mathematically accurate, but to be adapted to the eye of a spectator. To the eye a curve is a more pleasing form than a straight line, and the deviations from rigid correctness serve to give a character of purpose, almost of life, to the solid marble construction." The delicate curves and inclinations of the horizontal and vertical lines were first noticed by Pennethorne in 1837, verified by him in 1845, and in 1846 measured by Penrose, who published his well-known work on the subject in 1851, a second edition of which, with further notes, appeared in 1888. The rising curves given to the stylobate† and entablature, the hyperbolic sections to which the entasis of the column was worked, and the slight inclination‡ inwards of the axes of the columns, so as to give an appearance of greater strength, all entailed a mathematical precision in the setting out of the work and in its execution which would have been impossible in any other material than that of the Pentelic marble with which it was built. The entasis was first noted by Cockerell, and afterwards measured and verified by Penrose. It varies in

* *A Grammar of Greek Art*, p. 39.

† The three steps of the stylobate are virtually of equal height throughout; consequently the rise of about two and a half inches in the middle had been already attained in the stereobate or substructure. This was done partly by trimming the top course of Piraic stone, and partly by reducing the marble course immediately under the stylobate towards the corners (Penrose, *Athenian Architecture*, 2nd ed., p. 31). Vitruvius seems to have assumed that the curve of the entablature followed that of the stylobate. Penrose, however, points out (p. 104) that the reverse was the case: "To obviate a disagreeable effect produced by the contrast of the horizontal with the inclined lines of a flat pediment," which gave an apparent dip to the former, Ictinus seems to have decided that they must rise towards the middle, and that required a similar rise in the stylobate, so that the columns might be of equal height.

‡ First noticed by Donaldson and subsequently measured by Penrose, who

58. THE PARTHENON AT ATHENS FROM THE NORTH-WEST.

different temples and is not found in some, as, for instance, in the Temple of Nike Apteros and the temple at Bassae. The entasis is most pronounced in the Temple of Jupiter Olympius, and most delicate in the Erechtheum (the amount of deflection from a straight line being only ·0195 of a foot). The comparative entasis given approximately by Penrose * is twelve for the Temple of Jupiter Olympius, eleven for the larger order, and nine for the smaller order of the Propylaea, and eight, six and four for the Parthenon, Theseum, and Erechtheum respectively.

The Parthenon being a completed work, the evidence of the method of its construction and finish is mainly derived from other Greek buildings which for various reasons have never been terminated, such as the temples of Apollo at Delos, Nemesis at Rhamnus, and Ceres at Eleusis, and in the temple at Segesta already referred to, from which latter it may be gathered that the peristyle of a temple was the first part erected. In all these temples the columns are still unfluted, and the stylobate retains its unworked surface. In the stoa at Thoricus the steps still retain the ancones or ears, projecting bosses by which the stones were lowered into their position and worked backwards and forwards to obtain a fine joint. Where the stylobate received the lowest drum of the column the surface was sunk to its proper depth, and then worked lightly over to give some hold to the lower surface of the drum of the column. On this surface was traced the lower plan of the column, fluted, for on the lowest drum the flutes were finished for two or three inches in height, the rest being left roughly circular. At the next joint the arrangement was different. There a square sinking was made in the centre of the upper and lower face of each drum, about four and a half inches square by two and a half inches deep, in which plugs of cypress wood were fixed. In the centre of these wooden plugs was a circular dowel, on which the drums were worked round so as to grind the blocks closely together. Between the centre and the circumference a slight sinking was made to receive the dust produced by the grinding. There are from ten to twelve of these drums

calculated that the axes of the columns on the two sides of the Parthenon, if prolonged, would meet at a point 5,856 feet above the pavement. The axes of the angle columns, being inclined both ways on a diagonal line, have a greater inclination in the proportion of the diagonal to the sides of a square.

* *Athenian Architecture*, 2nd ed., p. 40.

in the Parthenon column. The upper portion of the drum under the capital was also fluted, and the echinus of the capital was turned in a lathe. All the joints of the drums were truly horizontal, but on the lowest drum, in consequence of the curve of the stylobate, the outer side had to be carried down a fraction lower than the inner side (towards the peristyle), and it is to this increased dimension that Vitruvius was supposed to refer when he mentions the *scamilli impares*,* but evidently his statement refers to the stylobate only. There was also a slight inclination inwards of the axis of each column which must have rendered very difficult the accurate bedding of the lowest drum. Similar difficulties were experienced with the capitals, and the sides of the abacus had a slight inclination, partly on account of the inclined axis of the columns, and partly to correct certain optical illusions which presented themselves to the acute observance of the architect: these would seem to be due to the position from which the building was seen, and to its illumination by the sun's rays.

59.—THE SOUTH PERISTYLE OF THE PARTHENON AT ATHENS, LOOKING EAST.

With a few exceptions the unfinished portions of those

* The remarks of Vitruvius on this subject are not clear. He seems to mean that the *scamilli impares* were used to obtain the gradual rise of the stylobate; but we know that in the Parthenon, at any rate (see note on p. 74), the rise was provided for in a simple way in the substructure. To adjust the lowest drums both to the curved stylobate and to the inclination of the columns was a far more complicated task, and it is to the additions left on the lower drum that Penrose and other authorities have applied the term *scamilli impares*.

temples not completed are confined to the stylobate and to the columns, these being the portions most liable to injury during their building. In the former the treads and risers were left rough, being drafted at their junction so as to obtain a fine joint. The columns retained their outer casing, the fluting being worked only a few inches on the upper and lower drums. On the completion of the temple the fluting of the columns was worked from top to bottom with that delicate entasis which gave such beauty to its outline, and the treads and risers of the stylobate were worked down to their smooth surface.

Although the Greek architects seem usually to have preferred regular geometrical curves such as the hyperbola, the parabola, and the ellipse, especially for convex mouldings where perfection of contour is more important than in concave mouldings, an approximate curve struck from three centres, and known as the false ellipse, was adopted (according to Penrose) for the fluting of the column in the Parthenon; the centre portion of the curve had a radius equal to the width of the flute, and the radii of the curves on either side diminished with the decreasing width of the flutes in the upper portions of the shaft, the principal object throughout being to accentuate the arris.

In the Propylaea the curves were segmental, as also in most of the earlier Doric examples in South Italy and Sicily. The templet was applied at every bed-joint and the intermediate space worked straight from one joint to another.

As they formed integral parts of the structure, the metopes (Ill. 57, p. 73) and the Panathenaic frieze on the external walls of the cella were probably carved *in-situ*, though the difference in the style of the carving of the various slabs of the latter has suggested to Dr. Murray that they might have been sculptured before being raised to their position. This is known to have been the case with the figures decorating the pediments, as there is evidence that the walling behind the figures had to be cut away in places to make room for them. The only literary notice we possess of the subjects of the pedimental sculptures is from Pausanias (Bk. 1, Ch. 24), who says "the whole subject of the pediment over the entrance"—viz., the East Pediment—"is the circumstances of the birth of Athena, and that of the pediment at the back is the contest of Poseidon with Athena for the land."

Drawings made by Jacques Carrey in 1674 give the position of the figures in the East Pediment, but in the West Pediment the central group was already missing. Nothing is said by Pausanias about the frieze representing the procession which took place every four years during the Panathenaic festival (Ill. 60). The frieze starts from the south-west angle, running east and north, and meeting over the pronaos, where the procession arrives

W. J. A. del.]

60.—PART OF THE FRIEZE OUTSIDE THE CELLA OF THE PARTHENON AT ATHENS: THE PANATHENAIC PROCESSION.

before the assembled gods who are grouped in the centre, seated, and who receive from the hands of the priest the peplos, while on each side the maidens selected to work the sacred robe approach bearing religious offerings.

Opposite to the Parthenon, and on the north side of the Acropolis, stands the Erechtheum (Ills. 61—63), a building as complicated in its plan as the former was simple. It was built on two levels, had three porticoes of different design, and seems to have been a combination of three temples in one. Whether this

irregularity was due to its occupying the site of earlier buildings, or to the necessity of preserving intact certain spots sacred to the Greeks,* is uncertain; but the architect, whose name is not known, would seem to have accepted the difficulties of the problem and designed a building which more than any other shows the elasticity of the Greek style.

Owing to many alterations, even in Roman times, and to the subsequent conversion of the temple, first into a church, and then into a Pasha's residence, the restoration of its plan is necessarily conjectural. The main block, built to be seen from the higher level, covers an area of thirty-seven feet by seventy-one feet, including the portico of six Ionic columns at the east end. The west front of the block had in Stuart's time four semi-detached Ionic columns between antae, and three windows.† On the north side of the block was a broad flight of steps leading to the lower level, and at the western end, but projecting westward of the main block, a portico of six Ionic columns, four columns in front and one behind each of the side columns. On the south side, and close to the west wall, is the Caryatide Portico‡ (Ill. 62), the marble roof of which is carried by six caryatide figures, four in front and two behind, all facing the south and standing on a podium about nine feet high.

Internally, twenty-five feet and forty-eight feet respectively from the east wall of the cella, are the attachments of cross walls, which would divide the same into three chambers. Of these, the eastern chamber, on the higher level, and entered from the portico of six columns, is supposed to have been the cella of the temple of Athena Polias,§ and the central

* It is on this site that, according to tradition, Athena and Poseidon are supposed to have contended for the dominion of Athens, and the mark of the trident in the rock, the well of sea water, and the sacred olive are all mentioned by Pausanias.

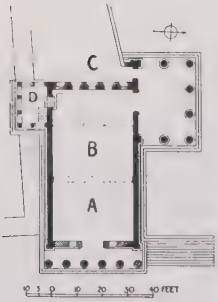
† These were all blown down during a hurricane in October, 1852; examination of the remains has led archaeologists to the conclusion that both columns and windows were of Roman date, and replaced four isolated columns in-antis.

‡ The term *portico* is a misnomer, for although there is a narrow opening in the podium on the east side, intended probably for the priests only, it does not form an entrance to the building. *Tribune* would be a better term.

§ In 1905, when excavations were being made under this temple, portions of the remains of two windows were found which are considered to have been in the east wall behind the Portico, one on each side of the doorway. According to the account given in the *American Journal of Archaeology*, vol. x., by Mr. Gorham Phillips Stevens (from whose drawings the illustration has been prepared), this east wall was destroyed to make way for the apse of the Byzantine Church established in the temple, and apparently the materials were utilised in the foundation of the apse. Illustration 64 gives Mr. Stevens's conjectural restoration of the east doorway and the windows, and the detail is worked out from a

Caryatide Portico. Portico of Temple of Athena Polias.

61.—THE ERECHTHEUM AT ATHENS, FROM THE SOUTH-EAST.

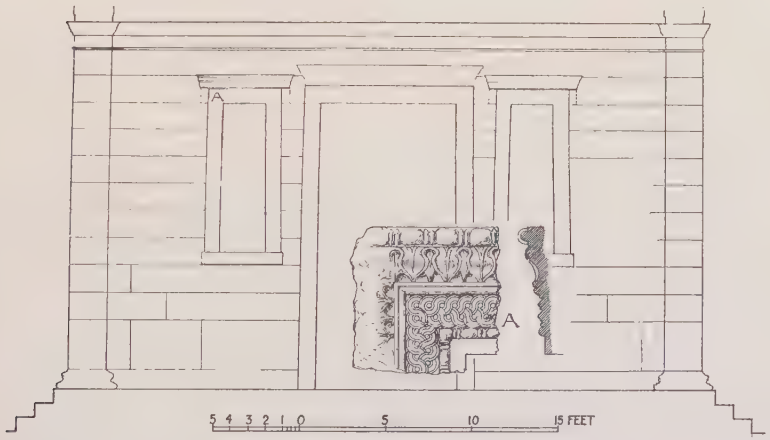


61A.—A. TEMPLE OF ATHENA POLIAS. B. TEMPLE OR SHRINE OF ERECHTHEUS. C. THE PANDROSEUM. D. TRIBUNE OF CARYATIDES.

62.—THE CARYATIDE PORTICO (TRIBUNE) OF THE ERECHTHEUM (SOUTH-EAST SIDE).

63. THE NORTH PORTICO OF THE ERECHTHEUM AT ATHENS.

and western chambers are supposed to have been divided by a screen of columns and constituted the shrine of Erechtheus. The sanctuary of Pandrosus is assumed to have been situated in the court to the west of the Erechtheum; the entrance to this court, in which the olive tree grew, being through a side door in the North Portico. Under the western chamber is an ancient cistern, originally covered with marble slabs, and occupying the whole width of the temple; and under the North Portico is a crypt, on the rock floor of which there are indentations, stated by Pausanias (I. 26) to have been pro-



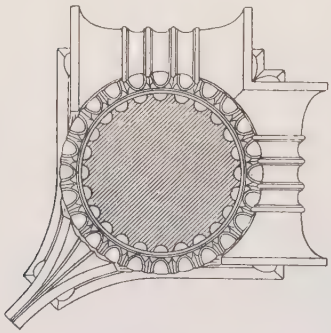
64.—THE EAST END OF THE ERECHTHEUM, SHOWING CONJECTURAL POSITION OF WINDOWS AND DETAIL OF PORTION FOUND.

duced by the trident of Poseidon. The entrance to the shrine of Erechtheus was from the magnificent central doorway of the North Portico (Ill. 63), which has always been regarded as of the finest Greek work, though according to Mr. Schultz* it has been restored and added to in later periods. The whole temple was built in Pentelic marble, with black Eleusinian marble for the frieze, to which figures in white marble were attached by clamps. The tympana of the east, west, and north pediments were also in Eleusinian marble. The intercolumniations and the relative proportions of diameter to

photograph published at the same time. The mouldings of the cornice and architrave of the windows were richly carved with the egg and tongue, the Lesbian leaf and dart, and the double guilloche.

* *Journal of Hellenic Studies*, vol. xii.

height of the columns vary in the two porticoes: in the East Portico they are two diameters apart, and the relation of diameter to height is 1 : 9·1; in the North Portico the columns are two and a half diameters apart, and eight and a half diameters high. The intercolumniation and relation of diameter to height of the semi-detached columns of the west front are the same, or nearly so, as those of the East Portico, the bases of the columns being on a level two feet seven inches higher than those of the latter. The capitals are of exceptional richness, there being intermediate fillets in the volute, a torus moulding, richly carved with the guilloche, above the egg and tongue, and, underneath the capital, a band or necking carved with the anthemion. A similar enriched band decorates the antae, and is carried round the whole building. The capitals of the corner columns of both porticoes have the volutes turned anglewise on the diagonal, so as to face both ways. The internal angles within the portico had therefore two volutes, intersecting one another at right angles as in Nike Apteros (Ill. 65), a somewhat unsatisfactory solution of the problem. Though the architrave still retains the three fascia, the dentils of the cornice which form such prominent features in the Ionic temples of Asia Minor are here omitted altogether and replaced by a carved cyma.

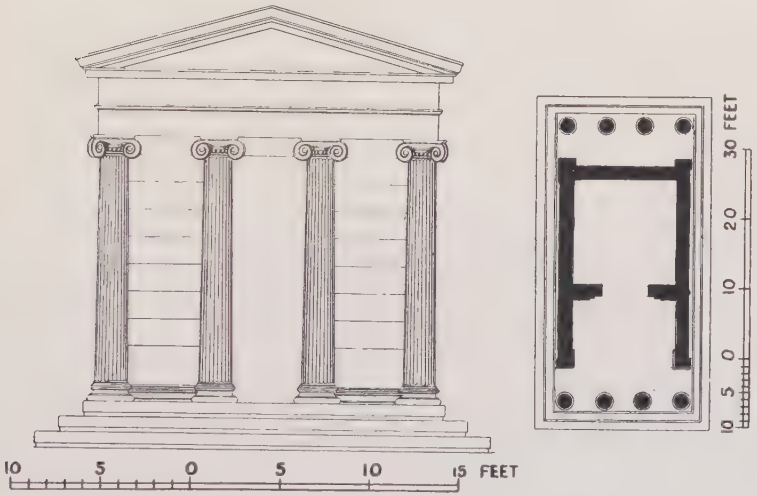


65.—ANGLE CAPITAL OF THE TEMPLE OF NIKE APTEROS.

The caryatide figures of the South Portico or Tribune probably represent the "arrephoroi" alluded to by Pausanias as "the maidens who bear on their heads what the priestess of Athena gives them to carry." The figures vary in the lines of the folds of their dress and in their pose; the three on the left hand rest on the right leg, and *vice versâ*. The vertical folds of the dress (which suggest the fluting of a column) are always on the side of the supporting limb. The remains of two similar figures have been found at Delphi,* of a much earlier period, according to M. Homolle, dating from the end of the sixth century B.C., which may be regarded as the prototype of those of the Erechtheum.

* See p. 102.

Although the Erechtheum was probably commenced about 430 B.C., the works were apparently stopped and not resumed till 409 B.C. The Temple of Nike Apteros was planned if not built before the Propylaea, and may date from 440 B.C. There is still another small temple in Athens on the borders of the Ilissus (Ill. 66) which was fortunately measured and drawn by Stuart before its destruction by the Turks in 1780. Although in no sense archaic, it is considered to have been of early date, 470—450; the entablature is of exceptional severity, there



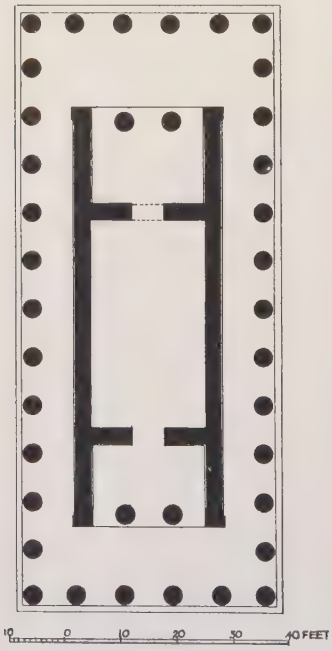
66.—ELEVATION AND PLAN OF THE IONIC TEMPLE ON THE ILISSUS.

being only one fascia to the architrave, and the bed mould of the cornice consisted of a cyma-reversa and bead only.

The perfected type of the Doric Hexastyle temple exists in the so-called Theseum, which owes its comparatively perfect preservation to the fact of its having been converted into a church by the Byzantine Greeks. It consists of a naos, with pronaos and epinaos, and is surrounded by a peristyle with six columns on the fronts and thirteen on the flanks (Ills. 67, 68). Only eighteen of the metopes are decorated with sculpture: ten on the east front, and four on the north and south fronts, adjoining the west end. A sculptured frieze runs above the pronaos and epinaos, in the latter case being carried across the north and south peristyles. The relative proportions of diameters to heights of the columns and other details have led

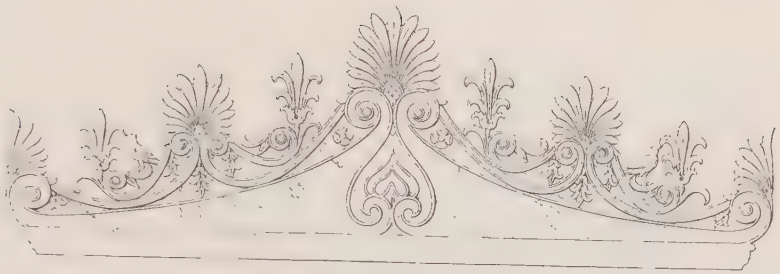
Dr. Dörpfeld to give it a later date than the Parthenon, and as the temple or heröon dedicated to Theseus is known to have been built by Cimon in 469 B.C., the existing building required another dedication, and is now recognised as the temple of Hephaestos mentioned by Pausanias.

In this chapter there have been considered chiefly the buildings of two distinct orders: the Doric Parthenon and Theseum, the Ionic Erechtheum and the temples of Nike Apteros and the Ilissus—two types of early Greek work which reach their culmination in the age of Pericles. All of them, except perhaps the Theseum, would be impossible anywhere else, for there are marks of a distinctive Attic style on each of the others. It is to be noticed that the familiarity with the Ionic proportion of columns led the Attic artists to reject the ponderous proportion of the Doric columns, and to adopt a mean which inclines more closely to the Ionic than any pre-existing examples. Yet the Parthenon, in spite of this and other details which have been noticed, such as its zophorus or sculptured frieze, and many of its ornaments, is substantially Doric, and, with the exception of the Theseum, the last temple in that style which the Athenians erected. Of the buildings we have noticed, the Propylaea combines most freely the Ionic-Doric principles, and most appropriately, each finding its true place, while in the Erechtheum the Doric survives in a few unimportant details. All of them thus in a measure illustrate the coalescence of type which is characteristic of Athenian work, as it was to some extent typical of the people themselves.



67.—THE TEMPLE OF HEPHAESTOS (THESEUM), AT ATHENS.

68. THE TEMPLE OF HEPHAESTOS (THESEUM) AT ATHENS.



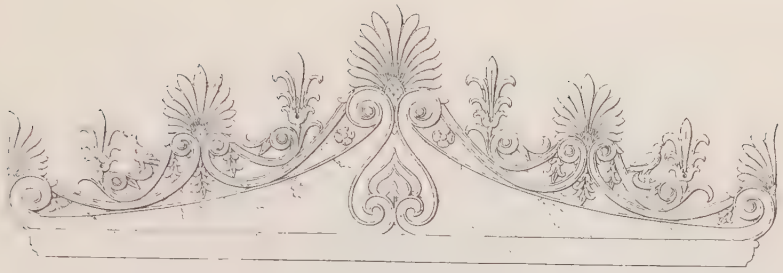
69.—MARBLE FRAGMENT FOUND IN THE HIERON AT EPIDAURUS, WITH CONJECTURAL RESTORATION BY L. VULLIAMY.

CHAPTER V.

THE CULMINATION IN ATTICA AND IN THE PELOPONNESOS.

HAVING in the last chapter described the monuments which illustrate the culmination of Greek architecture in Athens, we now extend our enquiry to other work in Attica and the Peloponnesos.

The Hall of the Mysteries at Eleusis, which forms the most conspicuous feature in the conjectural restoration (see frontispiece, Ill. 1) by J. P. Deering Gandy, R.A., and now in the Soane Museum, was designed 420 B.C. by Ictinus, the architect of the Parthenon, but, beyond the scheme of its plan (Ill. 70), no architectural remains have been found. The excavations commenced in 1883 by the Archaeological Society of Athens have revealed that there were two earlier temples on the site, the second one having been destroyed by Xerxes. The foundations of the present ruin, nearly four times the size of the earlier temples, belong to the work set out by Ictinus. The hall was one hundred and eighty-three feet square, with seven rows of columns running at right angles to the principal front, with six columns in each row. There were two entrance doorways in the front, and also two on the right and on the left sides. The hall was surrounded on all sides with steps or seats for the devotees, which were cut in the solid rock. The row of columns down the centre upsets the idea of any clerestory, but



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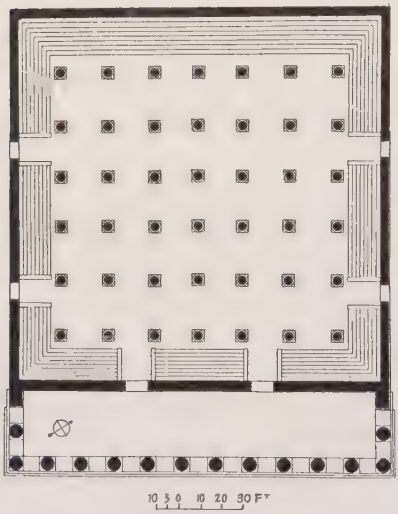
the hall may have been lighted through one or more compartments in the framed ceiling, and in that case only through the Parian tiles of the marble roof, which, according to Plutarch, was constructed by Zenocles.* In 320 B.C. a dodecastyle portico was added by Philon, the architect of the Arsenal of the Piraeus, and there are evidences of Roman restorations at a later period. On the site also was found a portion of a Doric entablature, comprising three triglyphs, on one of which is carved a bunch of ears of barley, on the second a barrel, and on the third the torches carried during the ceremonies. The sacred precinct of the temple was entered through two entrance gateways known as the Greater and Lesser Propylaea. The Greater Propylaea would seem to have been copied from the Propylaea at Athens, of which it formed nearly a counterpart both in design and size, except that there was no central passage for chariots, and the hexastyle portico of the main front was raised on a stylobate of six steps. In the Lesser Propylaea there are ruts formed by wheels on the pavement, but they had apparently no connection with chariots, there being no entry for them in the peribolos walls. Beyond the fact that there are three doorways, the central one of which was closed by massive gates (evidenced by the marks on the pavement), the plan differs from the ordinary propylaea. Between two walls (which are supposed to have been decorated with detached Ionic columns resting on a podium about four feet six inches high) and on the right and left of the entrance, the pavement rises rapidly to the central doorway, in front of which were two columns with antae. The capital shown in Ill. 71 crowned one of these columns, and, so far as it is possible to judge by the richly-



70.—HALL OF THE MYSTERIES AT ELEUSIS.

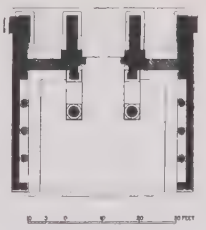
* See *Unedited Antiquities of Attica*, p. 31.

carved ornament, should belong to the third century B.C., but the building was restored and added to in Roman times. Of the columns decorating the side walls, a base, capital, and portion of the entablature were found, and their position is shown on

71.—CAPITAL FROM THE SO-CALLED LESSER PROPYLAEA AT ELEUSIS.

the plan (Ill. 72), published in the *Unedited Antiquities of Attica*. To this has been added a conjectural restoration of the Order (elevation and section, Ill. 73), in which nine diameters have been given to the column.*

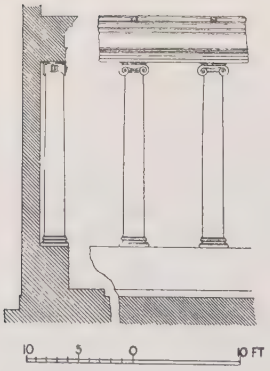
Although of the Hall of the Mysteries at Eleusis no architectural features remain, we have in the Temple of Apollo Epicurius at Bassae in Arcadia, 430 B.C., a remarkable example by the same architect which suggests the versatility of its author. We no longer find the same delicate subtleties of curve in stylobate or entablature as in the Parthenon, either because the architect recognised that such refinements were not possible in any other material than Pentelic marble, or, as suggested by Dr. Dörpfeld, the extraordinary labour and accuracy required in the work at Athens were of so costly a nature that they were not likely to be



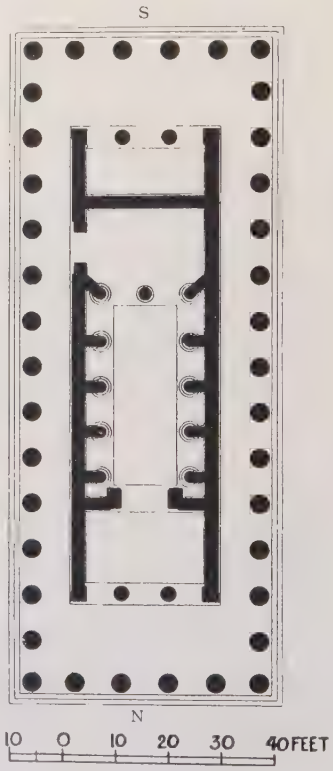
72.—THE LESSER PROPYLAEA AT ELEUSIS.

* This Order was selected and published by Ch. Normand (*Parallels*), and is reproduced in *The Orders of Architecture* (Plate VII.).

undertaken elsewhere. On the other hand, the plan (Ill. 74) departs from the usual conventional arrangements in detail, and new features are introduced which, in Athens, might have been thought to have too progressive a tendency. The plan of the temple runs north and south instead of east and west, and behind the cella is a second chamber with a doorway



73.—CONJECTURAL ELEVATION OF THE IONIC ORDER FLANKING THE ENTRANCE OF THE LESSER PROPYLAEA AT ELEUSIS.



74.—THE TEMPLE OF APOLLO EPICURIUS AT BASSAE.

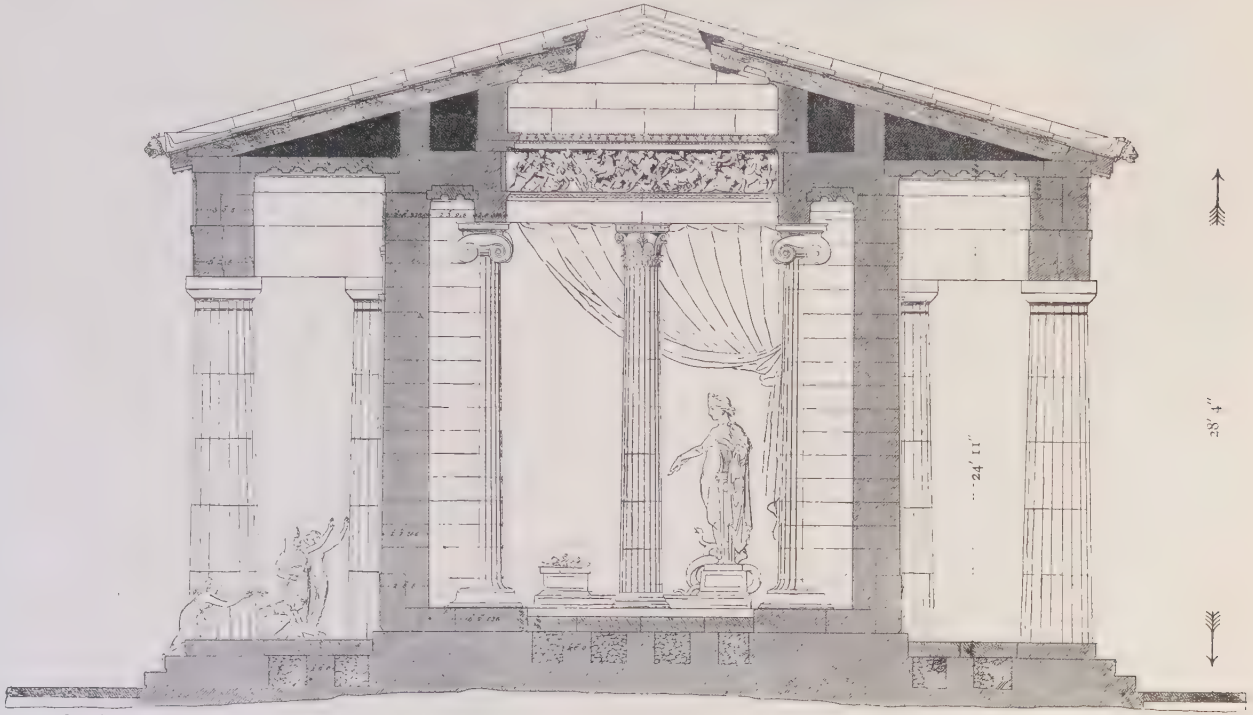
facing the east. It is possible, as suggested by Reber, that this covers the site of an earlier temple dedicated to Apollo, which the architect was instructed to bring into his design, and this would account for the unusual length of a temple of this period, there being fifteen columns on the flank. Externally the temple was Doric hexastyle, but on both sides of the cella are Ionic semi-columns, which are attached to the cella wall by small spur walls. This unusual arrangement, the

close juxtaposition of the first spur wall to the massive masonry of the north doorway and the diagonal spur walls at the south end of the cella, would seem to have suggested to Cockerell the possibility of there having been a thrust of some kind to be

75.—THE INTERIOR OF THE CELLA, TEMPLE OF APOLLO AT BASSAE AS RESTORED BY PROFESSOR COCKERELL.

resisted, and accordingly, in a sketch of the interior (Ill. 75), he introduced a segmental vault, but without making any reference to it in his description. To us the precautions may seem excessive, as the thrust could only have been against the east and west walls; but the Greeks, as already pointed out, were always timid in their stone construction, and preferred to

err in the direction of excessive strength than of too little Further reference to this will be made later on, but as its consideration raises the question of the construction of the Greek roofs, about which so little is known, owing to the complete destruction by fire or otherwise of all the timber therein employed, a few words thereon may not be out of place. Two instances have already been referred to in which it is surmised that there were horizontal ceilings over the cella, viz., in the Temple of Hera at Olympia, and of Concord at Agrigentum: there was also a flat ceiling over the central and western chambers of the Erechtheum at Athens, according to M. Choisy (*Études épigraphiques sur l'Architecture Grecque*). The nature of their construction is suggested in the same work, being based on the roof of the Arsenal of the Piraeus at Athens, a description of which was found in 1882, engraved on a slab of Hymettian marble. Although the building no longer exists, having been burnt by Sulla in 86 B.C., the description given in the specification is so clear and distinct that we know more about its construction than if its remains had been found. The arsenal was built between 340—330 B.C. from the designs of Philon of Eleusis, to store the rigging, sails, ropes, etc., of the Athenian navy. It was four hundred and thirty-one feet long by fifty-eight feet wide, and consisted of a central passage and two aisles. The former, twenty-one feet wide, served as a covered promenade; and in the aisles, separated from the same by square columns twelve feet centre to centre and screen walls between with doors in them, were stored the sails and ropes. The square columns, thirty-five in number on each side, carried huge beams (thirty inches wide by twenty-one inches high) longitudinally, and transverse beams across the central passage twelve feet centre to centre and over the columns. On the centre of each of these transverse beams rested a block of timber three feet long, which carried the ridge-piece (twenty-one inches by sixteen and a half inches). Resting on this, on the longitudinal beams, and on the external walls were rafters one foot seven and a half inches by eleven inches, and one foot three inches apart. On the rafters, battens, six inches by two inches, and four inches apart, carried the close boarding on which the Corinthian tiles were laid, bedded in mortar. From this description it follows that the trussing of timber in roofs was unknown

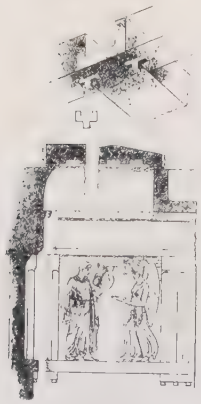


Cockerell's "Aegina and Bassae."]

76. TEMPLE OF APOLLO AT BASSAE: CROSS-SECTION THROUGH CELLA AND PERISTYLE.

to the Greeks, and that the rafters were carried by the ridge-piece and other direct vertical supports. Further evidence of the same is given in the Lycian, Phrygian, and Etruscan tombs, where are found reproductions of timber roofs carved in stone.

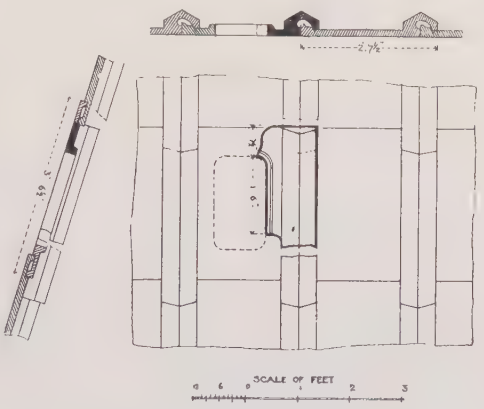
Returning now to the example at Bassae, transverse beams across the cella, just above the frieze richly carved with figure sculpture, would have ruined the effect of the latter so far as its lighting was concerned, and therefore Cockerell in his section (Ill. 76) trusts to the rafters to be self-supporting in the centre, in which case, if there had been any thrust, it would be counteracted by the spur walls of the cella, as also by the weight of the frieze, cornice, and wall shown in Cockerell's section. The Professor in his section shows timber rafters which are masked inside by linings and coffers, but if marble rafters (hollowed out like the beams*) of the north and south peristyles (Ill. 77) had been employed with the Parian tiles resting on them, there would have been no necessity to hide them inside or to fill the intervals between, and such a scheme of construction would not only have been similar to that of the ceiling of all Greek peristyles, but would have accorded with the statement of Pausanias (Bk. viii. Ch. 41): "The temple of Apollo, the succourer, is built of stone, roof and all," a description never given of any other temple. Now in the roof of the Piraeus, as already noted, it was necessary to provide the close boarding and a bedding of mortar for the Corinthian tiles, the under-surfaces of which would rarely be quite true; the Parian marble tiles of Bassae, however, were of such marvellous workmanship, and fitted to one another so exactly, that they were probably carried direct on the rafters. They measured three feet six and a half inches long by two feet one and a quarter inches wide (being the largest tiles known, and seven of them on each side covered the roof exclusive of the ridge and the eaves tile), the covering tile



77.—MARBLE BEAM AT BASSAE.

* The bearing of these beams is nearly thirteen feet: that of the rafters on each side of the cella would be just over seven feet. In order to lessen their weight the marble beams of the peristyle were hollowed out as shown in Ill. 77.

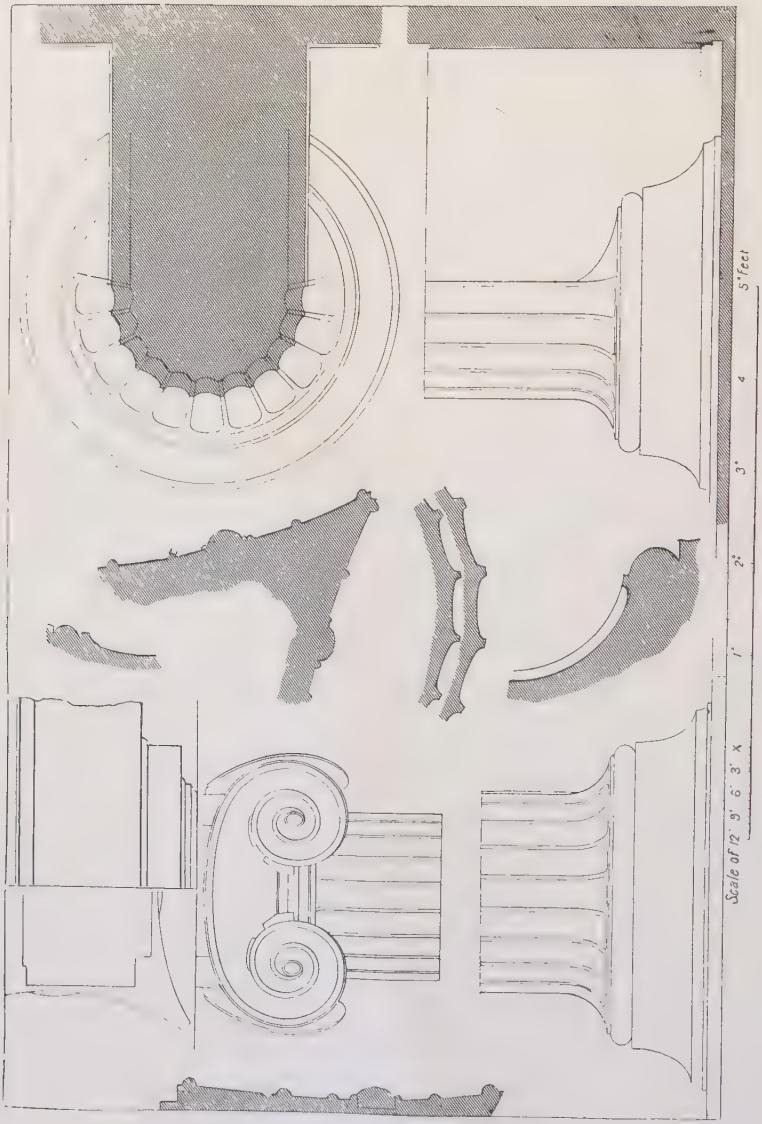
being on one side worked in the same slab as the main tile (Ill. 78). The translucency of these Parian tiles* was so great that through them the cella might have been flooded with light had the intervals between the rafters been left open ; these, however, in Cockerell's conjectural restoration, are filled with coffers, he being of opinion that the cella was lighted by a single central opaion in the same way as the Temple of Aegina, where a block was found which might have been the coping-stone of such an opening. At Bassae, however, only a portion of a tile was found with an opening pierced in it† and a raised rim round to prevent the rain running down through it. Unfortunately, too little remained to show whether such piercing was confined to a single tile, or whether it was the angle of a much larger opening. In a second visit paid by Baron Haller, who was Professor Cockerell's companion at Bassae when the temple was first explored by him, two other pierced tiles were found, drawings of which were published in the R.I.B.A. Transactions of 1865 : one of these seems to show a second angle, which would give a length of eighteen to twenty inches to the opening, and the distance from the centre of covering tile to the inside of the rim being seven inches, gives a width of eleven inches, always supposing that the piercing was confined to one independent tile. Covering the cella in the length are eighteen tiles, and on each side below the ridge tile two tiles. If a certain proportion of the upper range of these tiles were pierced, the opening,



78.—ROOF TILES AT BASSAE.

* In confirmation of this theory, see Penrose's statements in Whibley's *A Companion to Greek Studies* (p. 221), and Professor Percy Gardner's views in *A Grammar of Greek Art* (p. 37).

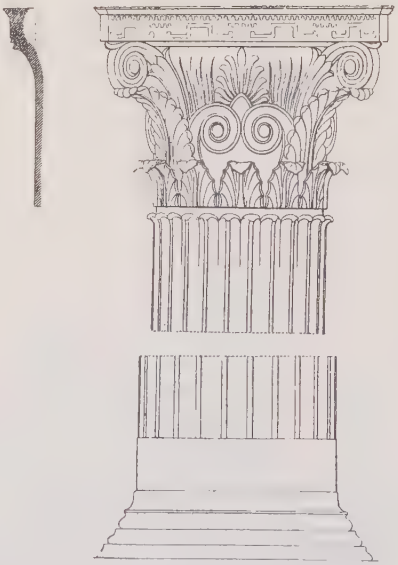
† A number of tiles with similar pierced openings have been found in Pompeii, and they also have projecting rims round them identical with those found at Bassae. Drawings of some of these tiles are illustrated in Josef Durm's *Die Baukunst der Römer* (1905), p. 333, ill. 363.



79.—THE IONIC COLUMNS OF THE CELLA OF THE TEMPLE OF APOLLO AT BASSAE.

twenty inches by eleven inches, would have afforded ample light to the cella, and the amount of rain which might fall into the cella would not be considerable. That an opening of some

kind was provided is suggested by the fact that the central portion of the cella was sunk three inches below the paved recesses between the cross walls in which the pedestals with their statues stood. The statue of the god was in the further cella, out of the way of any falling rain, and illuminated only through the eastern doorway. The large opaion* shown in Plate V. (plan of roof showing the tile found by Cockerell) does not seem to be a possible solution of the problem now that other tiles have been found, and, moreover, the moulding shown in his section (Ill. 76) does not exist on any of the tiles found, and there is no doubt that its extension across five tiles, as shown, would externally form a notch in the roof, which would have a very ugly effect.



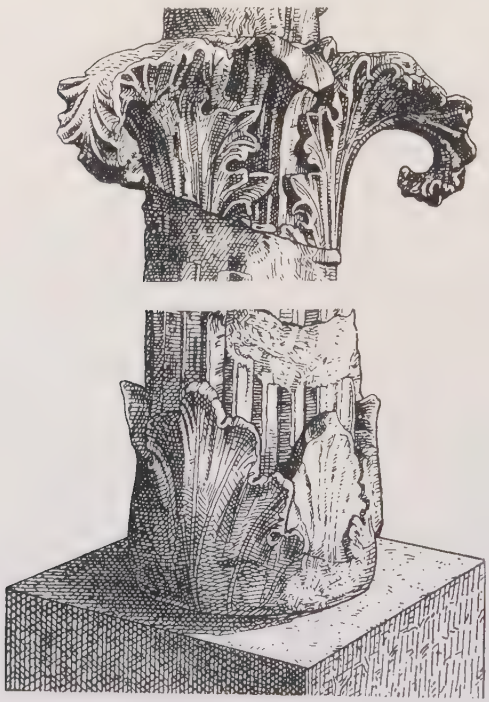
Scale half-inch to one foot.

80.—CAPITAL FROM THE TEMPLE OF APOLLO AT BASSAE.

The capital of the Ionic order in the cella (Ill. 79) is a new and original feature designed to meet the special requirements. Having only a semi-column to deal with, and desiring to detach completely three sides of his capital, Ictinus designed one with angle volutes at each corner. Instead of carrying horizontally the fillet which connects the two volutes of the ordinary Ionic capital, and which, owing to its junction with the curves of the volute, always appear to dip in the centre, Ictinus raised it and with a fine sweep made it a continuation of the curves of the volutes. This appearance of sinking in the centre of the upper fillet just referred to led, in earlier Greek Ionic capitals, to an attempted correction of the same by the uniting

* In the Taylor buildings at Oxford, designed by Professor Cockerell, the staircase hall is covered with a roof of similar design and with a skylight in the centre. Round the wall and at the same distance from the skylight, as in Ill. 75, the Professor has had reproduced the Bassae sculpture; the result, however, as regards the lighting of the figures, is disastrous, two-thirds of them being in shadow.

of the second fillets of the volute with a curved fillet which descends to the top of the echinus moulding. In the Erechtheum capital there are intermediate fillets, to render the effect more complete. The raising of the upper fillet, however, in the capital at Bassae resulted in another difficulty, viz., that of designing an abacus to fit it,* and the result is not quite satisfactory. The abacus as found aligns with the Corinthian capital at the end of the cella. The capital is not set out on the same axis as that of the shaft, and the side faces are diverse from that of the front and have a different inclination.



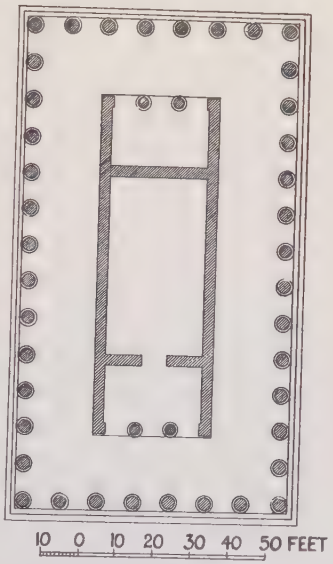
81.—BASE AND CAPITAL OF A VOTIVE COLUMN AT DELPHI.

This capital is the earliest example of the order known, and possibly predates its supposed invention by Callimachus as mentioned by Vitruvius. It is probable, however, that not only the idea of the bell capital, but its decoration with acanthus leaves, is of much more ancient origin. In the acanthus column found at Delphi (Ill. 81), and dating from the same period, viz., the last quarter of the fifth century B.C., the lower part of the shaft rises from a calyx of three acanthus leaves, and from the upper portion of the shaft spring three other acanthus leaves which support caryatide figures carrying a tripod. The great projection of these acanthus leaves, and the vigour shown in their carving, testify that as a

* In the first publication of this temple by the Dilettanti Society (Vol. IV.), and in Blouet's *Expédition Scientifique de Morée*, no abacus is shown, but it appears to have been carved out of a separate block (of which Cockerell gives the drawing) not known to earlier explorers.

decorative feature the foliage of this plant must have been adopted from a very early period. Of slightly later date, but with Ionic capitals and bases which recall the purity of those in the Acropolis, is the Temple at Messa in the island of Lesbos (Ill. 82), an octastyle pseudodipteral temple with fourteen columns on the flanks, and the usual plan of pronaos, cella, and epinaos.

Up to the present our references to the temples have treated of them as isolated buildings irrespective of their surroundings and enclosures, and as a rule the earlier travellers confined their researches and descriptions to the particular temple they had sought for and discovered. But the principal temples of Greece were invariably surrounded by a wall forming a sacred enclosure or temenos, in which the principal shrine and other subsidiary buildings connected with it were erected. In some cases, as in the Acropolis at Athens, the rock formed the sacred enclosure; in other cases, as at Olympia (Ill. 83*), where the site was a fertile valley, or as at Delphi, on the slope of a hill, the whole of the sacred site was enclosed, and contained not only the great temple and minor temples dedicated to various deities, but treasuries erected by various cities to contain their offerings and the regalia of their processions; stoas or colonnades, on the walls of which were painted various episodes in the history of the country, mythological or otherwise; altars; and votive columns and statues, set up in memory of victors in the games or heroes, or of munificent donors. In addition, the enclosures were often planted with trees and sacred groves, and provided with colonnades and exedra given by wealthy devotees.



82.—THE TEMPLE AT MESSA, IN THE ISLAND OF LESBOS.

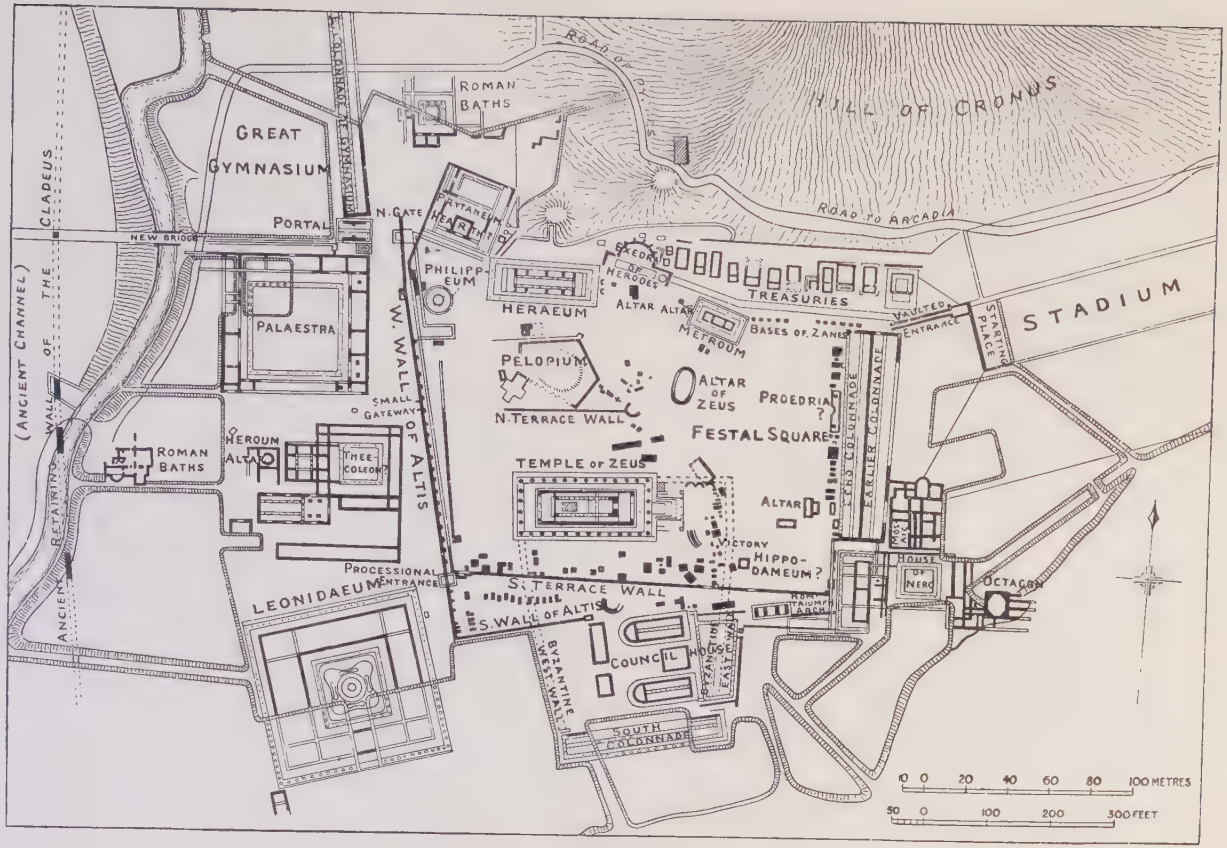
The discovery of these accessories has been brought about

* This illustration is reproduced from *A Companion to Greek Studies*, edited by Leonard Whibley, by permission of the Cambridge University Press, the publishers.

owing to the great change made in the method of research during the last twenty-five years. The sites of the great shrines are now in many cases completely excavated, and the superincumbent earth removed to a distance. By this system not only have new features in the plans been discovered which had escaped the attention of earlier explorers, but the foundations and the remains of numerous other structures have been found, adding considerably to our knowledge. In fact, those of the treasuries alone may be said to have added a new chapter to the history of architecture.

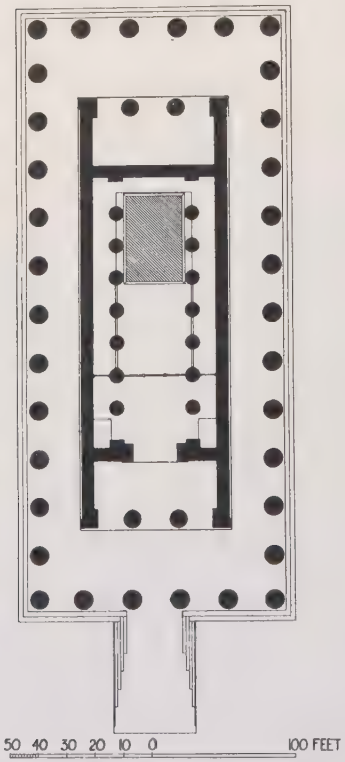
The conjectural restorations made by some of the "*Grand Prix*" students, such as those of Olympia, Epidaurus, Delphi, and Delos, based on the actual foundations so far as the buildings are concerned, and in many cases on the architectural remains, and supplemented by the addition of the grove of sacred trees with which the sanctuaries were planted, have suggested a magnificence, a combination of nature with art, which it is difficult to realise now to its fullest extent, and of which the only parallel is to be found in some of the Buddhist sanctuaries in India, China, and Japan, where, in consequence of a somewhat similar cult, temples, tombs, and other monuments exist up to the present day.

The researches of the explorers on all these sites have been greatly facilitated by the writings of Pausanias, who may be looked upon as the "Murray" of Ancient Greece, and with whose description it has been possible to walk through the sacred precincts and to locate the principal monuments, giving them their true names and dates—a course which has been made easier by the discovery of a very large number of inscriptions found on the sites. In some cases, and particularly at Olympia, the inhabitants during the Byzantine period had utilised the remains as materials for the building of enclosure walls. By the removal of these walls the recovery of such remains enabled the explorers to complete restorations which the inscriptions on them assigned to other buildings on the site. The conjectural restorations by Messrs. Laloux and Monceaux of Olympia convey a fairly correct idea of the splendour of that famous shrine; whilst those of Delphi by M. Tournaire of which the drawings were exhibited in the Paris Exhibition of 1900 are even more remarkable owing to the magnificence of the site on which the sacred enclosure was built.



83.—THE PLAN OF THE CITY OF OLYMPIA.

Portions of the remains of the Temple of Zeus at Olympia (Ill. 84) were already known, but the complete exposure of the plan has revealed features hitherto unrecorded. Apparently the building had never been converted into a church, as in the case of the Parthenon and other temples in Greece, and, therefore, the pavement is better preserved, and shows the traces of the folding gates between the columns and antae of the pronaos, as also those of the great door leading into the cella. Just within the same, on either side, have been found the sinkings in which it is supposed the newels of a wood staircase were fixed, which, according to Pausanias, led to a gallery on each side of the cella, and were continued up to the space between the ceiling and the roof. A range of seven Doric columns on each side divided the cella into a central and two side aisles, and carried the gallery, with an upper range of marble columns to support the ceiling. Across the cella and between the columns are the traces of a stone screen about five feet high, with folding doors in the centre and into each aisle. From the second to the fifth columns on each side were similar stone screens fitted within the central flutes of the columns. Beyond the fifth columns, and where the pedestal of the great statue stood, are traces of metal enclosures. Access therefore to the cella, and by staircases to the gallery, was given to privileged persons, so that they could approach nearer to the chryselephantine statue of Zeus. In front of the base of the pedestal was a pavement of bluish-black Eleusinian limestone, enclosed by a raised border of Pentelic marble, in which the oil, mentioned by Pausanias, was kept, the oil being apparently necessary to prevent the ivory



84.—THE TEMPLE OF ZEUS AT OLYMPIA.

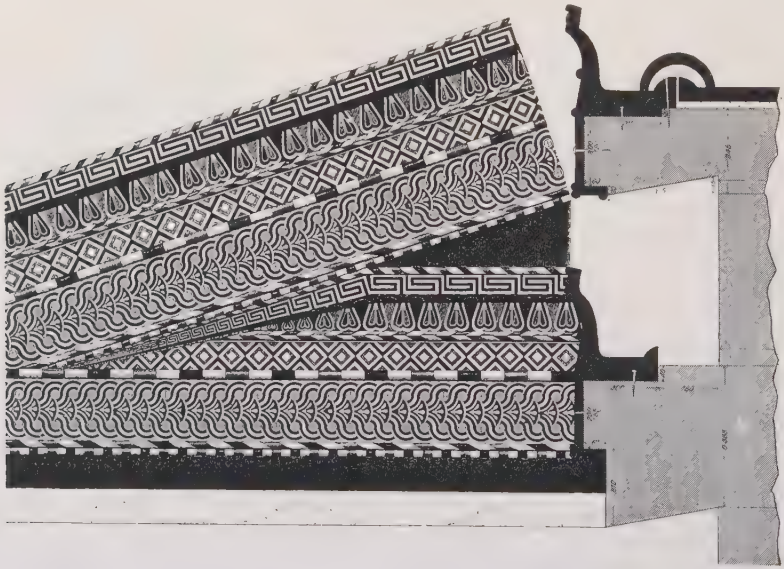
from splitting, and probably the wooden core from swelling, in the damp climate of the Altis.* The temple, which was hexastyle Doric, with thirteen columns on the flanks, was built in the coarse conglomerate stone of the district, covered with a thin coat of white stucco and painted. It was, however, roofed with marble tiles. The objection to the hypaethros in this temple is more pronounced in consequence of the climate, but there would be no objection to an opening in the ceiling through which the light penetrating the translucent tiles of Parian marble would have been sufficient to illumine the interior of the cella.

Akin to the temples, and situated within the sacred enclosure of the Altis of Olympia, were buildings known as Treasuries, which were built by the various cities taking part in the Olympian games, for the reception of their offerings, arms, and other properties. Similar treasuries existed at Delphi, Delos, and other sacred shrines to which pilgrimages were made. The plans of twelve of these treasuries have been laid bare at Olympia, on a terrace at the foot of Mount Cronos (Ill. 83). These buildings consist of a chamber about sixteen to twenty feet square, preceded by a portico-in-antis, and are all of the Doric order. One of the treasuries, that of Gela, is of more importance than usual: the chamber measures forty-two feet by thirty-five feet, and at a later date a hexastyle portico had been added to it. Although but few remains were found on the spot, numerous blocks of the cornice and pediments were found in the Byzantine walls round the site which have been proved to belong to the building, and in these blocks of masonry were found nails which showed that they were protected by terra-cotta slabs, of which numerous brilliantly-coloured examples were found (Ill. 85). Evidence of various kinds has been forthcoming which proves that this treasury was built by Sicilian architects, and that the terra-cotta plaques were imported from Gela, in the south of Sicily, founded 690 B.C. The protection of timber roofs by terra-cotta plaques was universal in Greece, but this is the only instance known in which the tradition seems to have been extended for the protection of stone. The date of this treasury has been assumed by Dr. Dörpfeld to be the first half of the sixth century B.C., the portico having been added a century later.

Although of smaller dimensions (twenty-eight feet by

* A similar precaution was taken in the Parthenon, except that in the latter water only was required to counteract the intense dryness of the Acropolis.

twenty-one feet), the Treasury of the Cnidians, discovered by the French at Delphi, is the most notably decorated example found. The vestibule consisted of a portico-in-antis, in which caryatide figures raised on pedestals, and carrying the polos with a projecting capital of singular design, took the place of columns. The enrichment of the mouldings of the entablature and pediment and the anthemion design on the soffit of the cornice (Ill. 86), and round the architrave of the doorway, are Ionian in style. The Treasury was built of Parian or Naxian marble, and brilliantly coloured. Vivid traces of colour existed in the fragments found, and the elaboration and carving of the mouldings



85.—TERRA-COTTA COVERING OF THE CORNICES OF ROOF: TREASURY OF GELA AT OLYMPIA.*
Colours of the terra-cotta: Light yellow, red, and black.

of the cornice are equal to those of the Erechtheum at Athens, which it precedes by nearly a century. The frieze, two feet one inch in height, was enriched with sculpture in high relief, painted in red, blue, and green, the effect being heightened by bronze spear-heads, wheels of chariots, and bronze harness fastened to the marble. In the pediment were groups of figures of less size, the upper portions of which were carved in the round and detached from the tympanum at the back.

* Ill. 85 is reproduced (to a smaller scale) from the magnificent work dealing with the German researches at Olympia, entitled "Die Baudenkwäler von Olympia," by F. Adler, R. Borrmann, W. Dörpfeld.

Among the important accessories in the temenos of a great temple were the stoas or colonnades which afforded protection to the visitors or pilgrims to the shrine. The Stoa Poecile at Olympia, so called on account of the paintings which decorated the wall at the back, stood on the east side of the Altis, and consisted of a double corridor three hundred and thirty-one feet long, with columns of the Doric order outside, and an inner range of Ionic columns inside to assist in carrying the roof.

At Epidaurus these colonnades, of which there were two ranging along the north side of the enclosure, were of the Ionic order, and one of the two was in two storeys. Their use here was of greater importance, in that they served as the temporary refuge of the patients who came to the shrine of Aesculapius to be healed of their ailments.

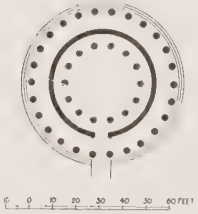
86.—SCULPTURED DETAIL FROM THE TREASURY OF THE CNIDIANS.

At Delphi, besides the Colonnade of the Athenians, built against the raised terrace of the Temple of Apollo, were two others outside the enclosure on the east and west sides, where the pilgrims were housed before their admittance to the temenos.

At Delos similar colonnades flanked the approach to the propylaea of the temenos, and on the north side of the same was the portico, three hundred and twenty feet long, known as the Stoa of the Horns, so called from the bulls' heads on the triglyphs. At the back of this portico, and entered from it, were a series of chambers the destination of which has never been determined. One of the most remarkable buildings at Delos is the Sanctuary of the Bulls, which measures two hundred and ten feet long by thirty feet wide, with a tetrastyle portico at one end, and at the farther end a hall at a lower level, to which one descended by a flight of steps, placed between piers decorated with two bulls on each side as bracket capitals, and semi-Doric capitals on the other side of pier.

Though of later date, there are two other buildings at Olympia and Epidaurus, within the temenos of these shrines,

which should be noted. The circular building in the former, called the Philippeum, commenced by Philip 339 B.C., and completed by Alexander, consists of a circular cella surrounded by a peristyle of eighteen Ionic columns. The walls of the interior were decorated with semi-detached columns of the Corinthian order, with, according to T. Hayter Lewis, an upper range above them reaching to the roof. The rafters of the roof, covering both peristyle and cella in one slope, were, according to Pausanias, held together at the top by a bronze poppy, which formed a central finial. The cyma in terra-cotta is shown in Ill. 115, page 131. The Rotunda (Tholos) at Epidaurus was a much more beautiful example, and of its remains sufficient have been found to give a conjectural restoration (Ill. 87). It is more probable that the roof rose in one slope from the peristyle cornice to an open-



87.—PLAN OF THE THOLOS AT EPIDAURUS.

88.—CAPITAL FROM THE THOLOS AT EPIDAURUS.

ing or impluvium of some sort in the centre, and was not of the design shown in Defrasse's work.* The building consisted of a circular cella, with an external peristyle of twenty-six Doric columns, and inside a circle of fourteen Corinthian columns, with extremely beautiful capitals (Ill. 88), showing a

* *Epidaure*, par M. Alphonse Defrasse.

marked advance on that already referred to at Bassae, which precedes them by about thirty years. Both the Tholos and Theatre at Epidaurus are stated by Pausanias to have been built by Polycleitos the younger, and date from about 400 B.C.

Among the structures erected in the sacred enclosures were altars, some of which were of considerable size, but beyond their foundations all traces of their design have disappeared. In the great Altar of Zeus at Pergamum, discovered by the Germans

89.—BASE AND PORTICO OF THE GREAT ALTAR OF ZEUS AT PERGAMUM (REPRODUCED FROM *Pergame*, BY M. PONTREMOLI AND MAX COLLIGNON).

in 1880, sufficient remains have been found to justify a conjectural restoration, at all events, of its magnificent podium (Ill. 89). The altar was built by Eumenes II. (191—152 B.C.) on the second terrace of the acropolis overlooking the valley of the river Seleucus, and was raised on a podium seventeen feet six inches high, which measured one hundred and twenty-eight by one hundred and ten feet. Round the sides, at a height of eight feet from the ground of the terrace, was a frieze seven feet six inches high, carved in high relief, representing the Gigantomachia, or battle of the Gods and the Giants, and of

which three-fourths is now in the Museum at Berlin. In the principal front, facing the east, was a flight of steps seventy-four feet wide, which rose between wings of the podium, leading to the altar, which was surrounded by a wall also carved with bas-reliefs. On the outside of this wall was an Ionic peristyle, which was carried to the front of the podium, returning on each side of the steps, and (according to the German authorities*) carried across the top of the steps in front of the altar.

On the terrace above the altar was the Temple of Athena Polias, of the Doric order, enclosed in a square court, on two sides of which was a colonnade in two storeys.

* This proposed restoration would, however, mask the great altar, the sacrifices at which were probably intended to be seen from the plain below. Moreover, it does not accord with the representation shown on the Pergamum coin struck in the reign of Septimius Severus (193—211 A.D.), on which an altar, of simple design and of less height than the Ionic peristyles, is shown standing between them. In the conjectural restoration by M. Pontremoli (*Pergame*, E. Pontremoli et Max Collignon, 1900), the peristyles are dwarfed by the immense altar shown.

90.—CAPITAL FROM THE TEMPLE OF APOLLO DIDYMAEUS AT MILETUS.

CHAPTER VI.

THE ALEXANDRIAN PERIOD.

We now return to Asia Minor, to deal with the monuments which still testify to the greatness of Greece even in her decline. The supremacy of Athens was but short-lived, for there followed a long succession of wars, Sicilian, Peloponnesian, and Corinthian, draining all her energies, besides depriving her of her leadership of the Greek race, to which Philip of Macedonia showed himself to be the true heir. The next important event politically was the triumph of Alexander in Asia Minor. After bringing Greece to his feet in 334 B.C., he set out for Asia, where in one year he added to his territory the whole of the Ionian colonies, besides part of Lycia, Pamphylia, and Phrygia. From Ancyra Alexander marched to meet the army of Darius III. from Babylon in contest for the empire of Asia, and entirely routed the Persian host. The success of his arms led to a revival of architectural grandeur in Asia Minor, in which the qualities of the magnificent and ornate are conspicuous.

We have already noted that in some of the earliest archaic Ionic capitals that which is known as the egg and tongue moulding was carried round underneath the volute, being in fact the crowning feature of the shaft. It is not possible, however, to assume that it constituted a rule, because already in the archaic Ephesian capital only the lower portion is visible under the cushion of the volute, and the bead below has

become the upper moulding. The tendency, however, in the Alexandrian periods was to raise still further the carved echinus so that it ultimately ranged with the second curve of the spiral of the volute, and in that case disappeared altogether under the cushion. In the earliest example of the long list of temples in Asia Minor, which we have now to describe, the Temple of Diana at Priene, near Miletus (a small but beautiful example built in 340 B.C. from the designs of Pythios), only the lowest fringe of the egg and tongue is visible, and here the bead which comes underneath it is carved out of the upper drum of the shaft. The temple was hexastyle, with eleven columns on the flanks, and is of the ordinary plan, with pronaos, cella, and epinaos. One or two of the capitals of the peristyle and the capital of one of the antae are in the British Museum.

91.—CAPITAL OF PIER CARRYING A STATUE IN THE TEMENOS AT PRIENE.

The propylaeum of the temenos of the temple is of somewhat later date, and has tetrastyle porticoes of the Ionic order in the front and rear, one of the capitals of which, now in the British Museum, may be from thirty to forty years later than those of the temple. The walls of the propylaeum are, however, decorated externally with flat pilaster strips, in which there is a slight diminution of the diameter, a departure from Greek principles, which suggests a later rebuilding. According to Pullan, there is no authority for the square piers carrying the ceiling of the propylon as shown in the restoration published in *The Ionian Antiquities*, vol. iv.; and the capital in the British Museum (Ill. 91) which, it is supposed, crowned one of these piers, has an additional member above the abacus; moreover, on its upper surface are sinkings, which suggest that it carried a bronze statue. The capitals of the pilaster strips were apparently of the

same design* as this pedestal cap, and of two others of much larger size, one of which is also in the British Museum. To judge by the unfinished surface of the member above the abacus, it was probably sheathed with bronze. In this cap also were sinkings, the use of which has lately been disclosed through the discovery of one of the bronze statues

92.—DRUM OF COLUMN FROM THE TEMPLE OF DIANA (ARTEMIS) AT EPHESUS.

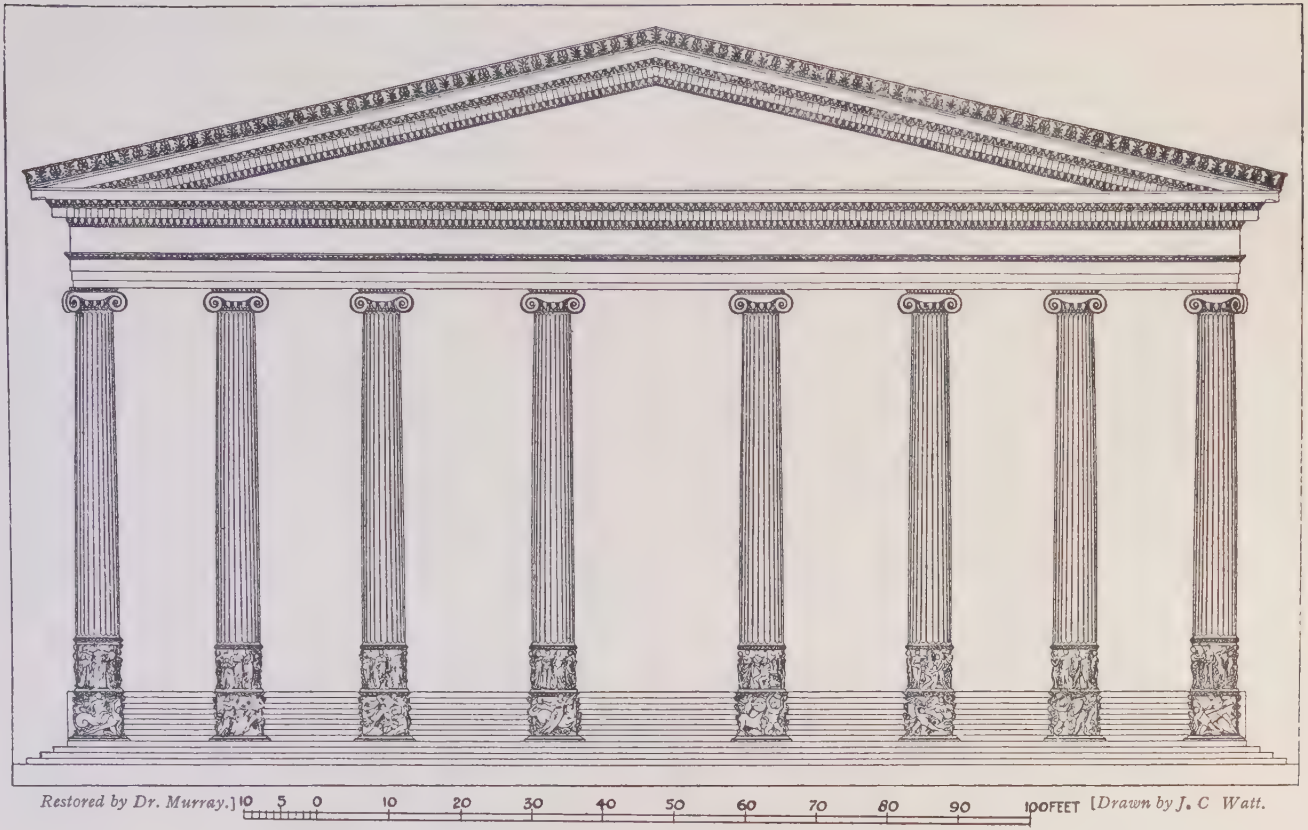
off the island of Cerigo; this was apparently wrenched off its pedestal, as the lead which secured it to its stone base is still attached to the bronze foot.

Though not the largest, the most important temple in Asia Minor was the great temple of Diana (Artemis) at Ephesus.

* Failing another term, the Germans give the name of saddle to that portion of the Ionic capital in which a second spiral is carried across the capital and down to the top of the echinus. The term "cradle or sofa volute" might be applied to the capital (Ill. 91).

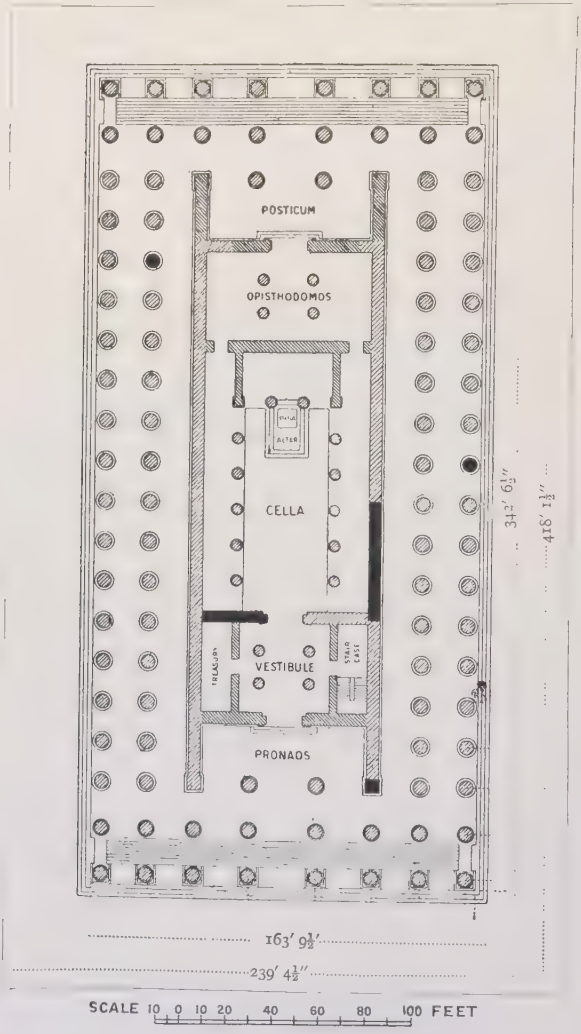
We have already referred to the archaic temple built about the middle of the sixth century B.C., which, according to the careful investigations made in 1905, was built over the site of three earlier, but much smaller examples. The archaic temple of the sixth century was burnt in 356 B.C., and rebuilt immediately afterwards at a higher level (9 feet, according to Mr. Henderson), in still greater splendour, borrowing apparently from the earlier temple the idea of the sculptured columns found only at Ephesus. It was probably the beauty of these sculptured decorations (which extended not only to the lower portion of thirty-six of its columns, but also to square pedestals carrying some of the latter, Ill. 93) which caused this temple to be classed among the wonders of the ancient world. The site of the temple was discovered and excavated by J. T. Wood in 1869-74, and the remains brought over and placed in the British Museum. The conjectural restoration by Murray, based on a long study of the sculptured drums and pedestals, which form so important a part of the remains in the British Museum, has been generally accepted by both English and foreign archaeologists. The temple had one hundred columns, thirty-six of which were sculptured on the

93.—SCULPTURED PEDESTAL AND DRUM FROM THE TEMPLE OF DIANA (ARTEMIS) AT EPHESUS.



94.—RESTORED FRONT ELEVATION OF THE TEMPLE OF DIANA (ARTEMIS) AT EPHESUS.

lower drum. Wood found two of the columns of the peristyle of the north and south flanks *in-situ*, about one hundred feet run of the lowest step of the stylobate on the south side, and the foundations of a great portion of the rest of the structure, which, with Pliny's statements, shows that the temple was octastyle, dipteral, with pronaos, vestibule, cella, opisthodomus, and posticum. The chief problem to be solved was the relative position of a series of square sculptured pedestals (Ill. 93), not specifically mentioned by Pliny, and the thirty-six columns with sculptured drums. Finding that the height of the platform on which the peristyle rested would coincide with that of the square pedestals, Murray placed eight of the sculptured columns on the latter* both



95.—PLAN OF TEMPLE OF DIANA (ARTEMIS) AT EPHESUS AS RESTORED BY DR. MURRAY.

* The raising of the *Columnae Coelatae* on the square plinths was suggested many years ago by Fergusson, but it is still an open question, and if the researches

at the east and west ends (Ill. 94). In the rear of these, standing on the platform, are eight more at each end, and of the remaining four sculptured columns two in the pronaos and two in the posticum. A stylobate of four steps is carried round the whole structure, and a flight of nine steps, to reach the platform at the east and west ends, placed between the first and second rows of columns. The bases of the wall and columns tinted black on the plan (Ill. 95), were discovered by Wood, and the foundation of other parts of the temple, which show that beyond the pronaos was a vestibule in which were probably the staircases leading to the roof, a cella with ranges of superposed columns on each side to carry the ceiling, the opisthodomus or treasury beyond, and the epinaos or posticum in the rear at the west end. The architects of the temple were Paeonius and Demetrius, both of Ephesus; and the former is said to have been employed, with Daphne of Miletus, to build the temple of Apollo Didymaeus or Branchidae near Miletus.

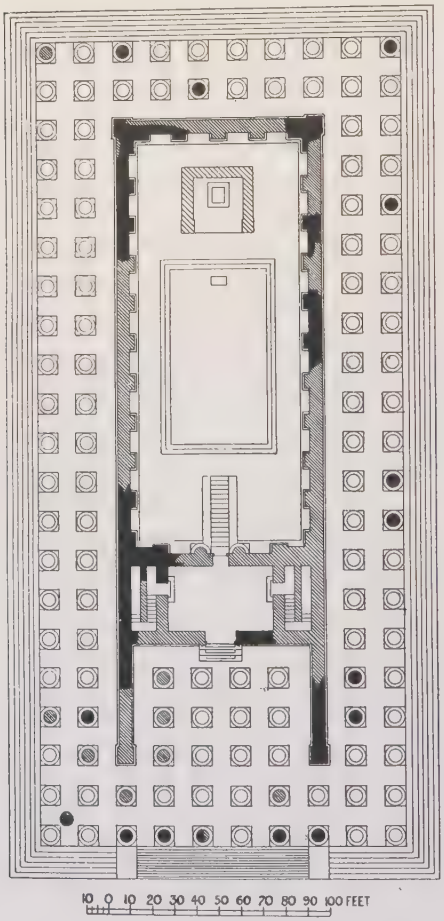
The temple of Apollo Didymaeus was the largest temple in Asia Minor. There was an earlier temple on the site, with a sacred way leading to it, which was bordered by the archaic seated figures, some of which are in the British Museum, to which reference has already been made: this temple was burnt by Darius, and after a partial restoration completely destroyed by Xerxes. The new temple was so large that, according to Strabo,* they were unable to roof it; in other words, the cella was hypaethral, one of the few examples about which there is no doubt, though, curiously enough, Vitruvius does not refer to it. Although chronologically it is given as having been rebuilt shortly after its destruction by Xerxes, the remains suggest a much later date. One of the two architects employed was Paeonius, the architect of the temple of Diana at Ephesus, and it is suggested by Messrs. Rayet and Thomas † that probably shortly before the completion of the latter temple, about 334 B.C.,

made in 1905 (when the exact position of every stone on the site was carefully noted, with its relative height), should show that there was no platform as suggested by Murray, and that the steps were in one flight from the outer step shown on Ill. 95, it will be necessary to raise the square sculptured plinths and place them on the same level as the circular sculptured columns alternating with them, and possibly included in the thirty-six columnae caelatae cited by Pliny.

* Strabo (lib. xiv.) says: "In after-times the inhabitants of Miletus built a temple which is the largest of all, but which, on account of its vastness, remains without a roof, and there now exist, inside and outside, precious groves of laurel bushes."

† *Milet et le golfe Latmique*, par Oliver Rayet et Albert Thomas.

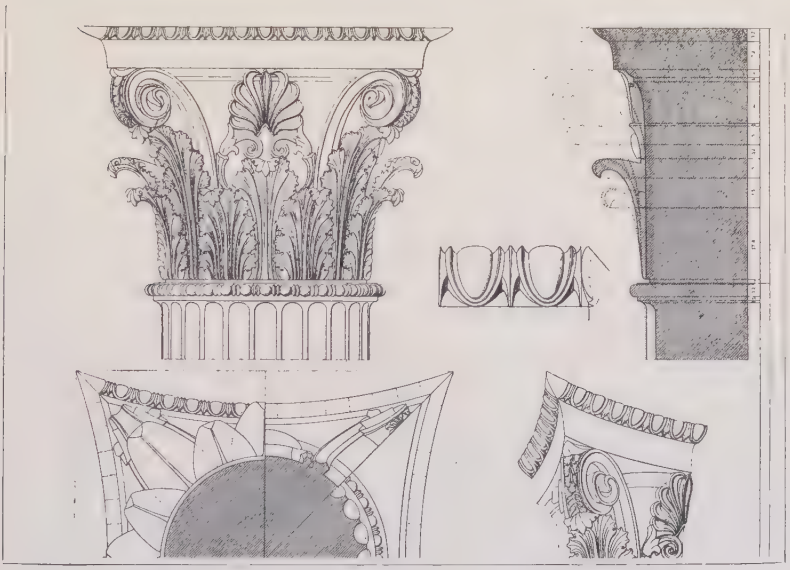
he was employed, with Daphne of Miletus, to build the temple of Apollo Didymaeus. As the temple was dipteral (*i.e.*, with a double peristyle of columns all round), it was probably carried out before Hermogenes, according to Vitruvius, conceived the idea of omitting the inner row of columns in the temple of Artemis Leucophryne at Magnesia-ad-Meandrum, making it pseudodipteral. Hermogenes flourished during the last quarter of the fourth century B.C., so that we shall not be far wrong in attributing a date of 334—320 to the Didymaean temple.* This would accord with the design of its Ionic capitals, which are later than those of Ephesus, and with the exuberant richness of the ornament of the bases of the columns, in which they would seem to have attempted to rival, though in another direction, the famous *columnae caelatae* of the latter. The Didymaean temple was not only remarkable for its size, but for its design. It was decastyle and dipteral, with a deep pronaos, followed by an antechamber, known as the Chresmographion, where the oracles



96.—TEMPLE OF APOLLO DIDYMAEUS AT MILETUS. (Rayet and Thomas.)

* In the later excavations carried out by Messrs. Pontremoli and Haussolier, portions of the external frieze were found with heads of Zeus and Apollo bearing so strong a resemblance to the sculptures of the Great Altar at Pergamum built by Seleucus II. (197—160 B.C.) as to suggest a later date for the completion of the Temple; on one of the Ionic capitals found, busts of Apollo decorated the volutes, with a bull's head in the centre. M. Haussolier is also of opinion that there was no pediment.

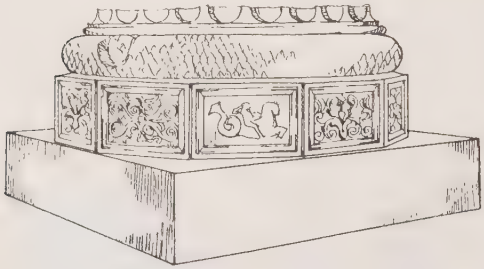
were delivered, on each side of which were stone staircases, carried between walls. The cella formed an open court, to which one descended by a flight of steps, the pavement being sixteen feet six inches below the level of the peristyle. In the centre of the cella no pavement was found, which led Messrs. Rayet and Thomas to assume that it was planted with trees and shrubs. At the further end they traced the foundations of a shrine, measuring thirty feet by twenty-eight feet, open in front, with antae on each side, the capitals of which were found



97.—CAPITAL OF SEMI-COLUMN IN TEMPLE OF APOLLO DIDYMAEUS AT MILETUS.

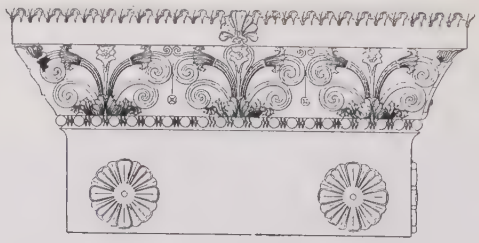
on the site, decorated in the centre with a winged figure and leaf ornament on either side. In this shrine was placed the bronze figure of Apollo, which was taken away to Ecbatana by Xerxes, and brought back by Seleucus about 295 B.C. The walls of the cella were decorated with immense pilasters, six feet wide and three feet deep, resting on a podium, so that their bases ranged on the same level as those of the peristyle. The height of the pilasters, including capital and base, was nearly the same as that of the peristyle columns. The capitals of the pilasters were very varied in design (Ill. 90, p. 107), and between the capitals

ran a band sculptured with griffins and lyres. There were nine pilasters on each side, and three at the west end, with return responds at each angle. At the east end of the cella, on either side of the entrance door, were semi-detached columns, the Corinthian capitals of which are more fully developed than any example hitherto quoted (Ill. 97). The spirals in the centre of each face, which carry the anthemion ornament, however, are small, and leave too much of the surface of the bell uncovered.



98.—DODECAGONAL BASE OF TEMPLE OF APOLLO DIDYMAEUS AT MILETUS.

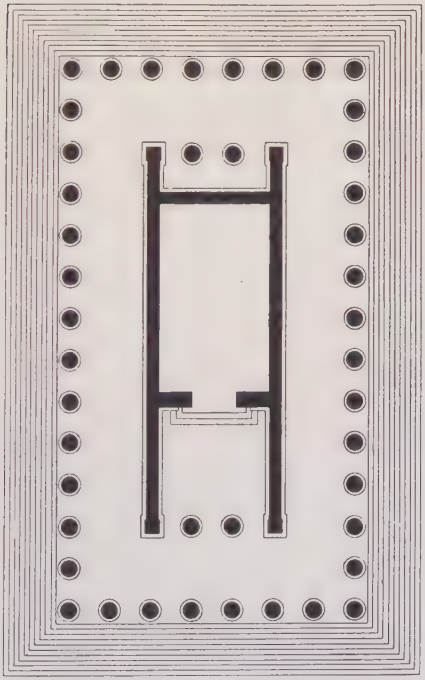
In the temple at Priene, already referred to, the bases of the columns of the peristyle rested on square plinths, features never found in the purer Greek temples, as they would interfere with the free passage round. Similar plinths are found in the temple of Apollo Didymaeus, where the diameter of the column is six feet six inches, notwithstanding the great projection which such a plinth must have had diagonally. In the bases of the principal part of the temple there is considerable diversity in design, and the upper and lower torus mouldings are richly carved. One of the bases found is quite exceptional in its design; the scotia and lower torus are replaced by a dodecagonal base, each face of which is panelled and decorated within with conventional foliage, and in one panel with a figure riding a sea horse (Ill. 98).



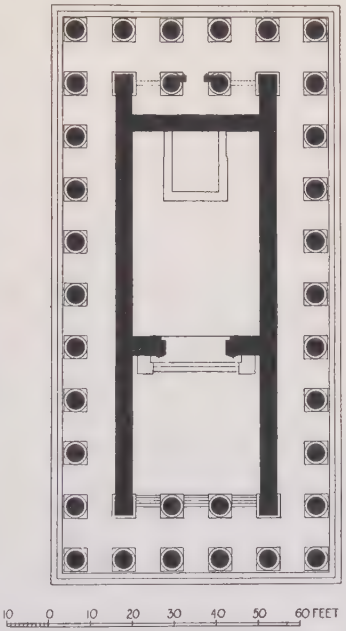
99.—ANTA CAPITAL OF THE BATHS AT CNIDUS.

Next in date and dimension to the two temples just described comes the Temple of Artemis Leucophryne at Magnesia-ad-Meandrum. Originally dipteral and of the fifth century, it was rebuilt by Hermogenes (330—300 B.C.) and made pseudo-dipteral.

The new temple was octastyle, with fifteen columns on the flank, and, like the temple at Ephesus, was raised on a platform. Hermogenes was also the architect of the Temple of Dionysus (Bacchus) at Teos, a smaller example, hexastyle, peripteral, with eleven columns on the flanks. The capitals and base are of poor design. The temple of Apollo Smintheus in the Troad (Ill. 100), which, with those at Teos and Priene (Ill. 101), were published by the Society of Dilettanti in the



100.—TEMPLE OF APOLLO SMINTHEUS (SMINTHEUM) IN THE TROAD.



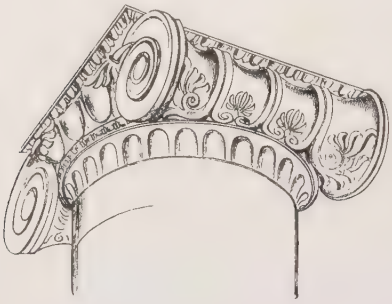
101.—TEMPLE AT PRIENE.

fourth volume of the *Antiquities of Ionia*, is a finer example, with a further enrichment of the capital above the egg and tongue moulding. The temple was octastyle pseudo-dipteral, with fourteen columns on the flanks.

The antae capitals of the edifice at Cnidus, known as the baths, are of great purity of design (Ill. 99). The rosettes on the capital recall those often found on Greek stele.

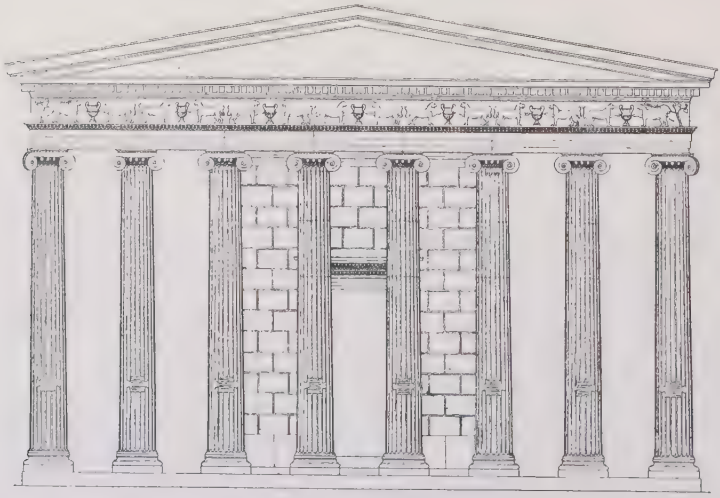
Other less known Ionic temples in Asia Minor are those of Cybele at Sardis, whose Ionic capitals (Ill. 102) were specially admired by Cockerell; of Aphrodite at Aphrodisias

(Ill. 103), and of Aizani in Phrygia. The two latter are probably of late date, but as they were executed by Greek artists still working on ancient tradition, they retain a much greater purity of style than that found in Roman work. The capitals of the columns of the pronaos at Aizani (Ill. 104) are decorated with a single row of acanthus leaves under the volutes, constituting therefore composite capitals, and the earliest known, if the date attributed to them (first century B.C.) be correct.



102.—CAPITAL OF THE TEMPLE OF CYBELE AT SARDIS.

Having now exhausted the list of the Ionic temples in Asia Minor, we have to retrace our steps in point of date to describe other monuments of the Ionic order, the most important of which, and dating from the middle of the fourth century B.C.,



103.—TEMPLE OF APHRODITE AT APHRODISIAS

was the Mausoleum at Halicarnassus built by Queen Artemisia in memory of her husband Mausolus, who died in 353 B.C. According to Pliny, the monument ranked among the seven wonders of the world, owing to the eminence of the artists who

were called in to adorn it with sculpture. These were Bryaxis, Leochares, Timotheus, Scopas, and Pythios. The monument consisted of a lofty podium carrying a peristyle (pteron) of thirty-six columns. Above the pteron was a pyramid contracting itself by twenty-four steps into the summit of a meta. On the top was the marble quadriga sculptured by Pythios. Pliny's dimensions are sixty-three feet for the north and south sides of podium (?), a shorter space on the fronts, four hundred and eleven feet for the entire circuit of platform (?), one hundred and forty feet for the total height, and twenty-five cubits for the height of the pteron, which dimension accords with the height of the order in the British Museum.

104.—CAPITAL OF COLUMN IN PRONAOS OF TEMPLE OF JUPITER AT AIZANI.

The site was excavated in 1856 by Sir Charles Newton, and the remains discovered brought over and deposited in the British Museum.* Long previous to their discovery the conjectural restoration of the monument had been a favourite problem with many architects, and one of these restorations is now in the British Museum. Cockerell's restoration was based on the description given by Pliny and other authors, and although the actual remains have proved it to be incorrect in some of its features, its architectural design sets forth the intimate acquaintance of its author with the principles of Greek art. Unfortunately Pliny's description is so vague, and the remains found are comparatively so few, that the problem is yet far from being solved. The exceptions to be taken to Cockerell's design are, first, the square piers at the angles, in the place of which were columns, as evidenced by the portion found of an angle volute; (2) the introduction of the attic storey, for which there is no authority;

* Ill. 105 shows the restoration of the order as set up in the British Museum.

(3) the question whether the cella in the centre is in accord with Martial's description of the Mausoleum as "hanging in open air"; and (4) the rise and tread of the steps of the pyramid and their design, which does not agree with the examples in the Museum. Of other restorations by Fergusson, Pullan, and Mr. J. J. Stevenson, the design of the latter, published in the *Builder* of August, 1896, is the one which accords best with the description and dimensions given by Pliny, Martial, and others. Mr. Stevenson's design is based on another though later tomb at Mylasa. In it he utilises the steps with broad tread (which undoubtedly belong to the roof) for the lower degrees of the pyramid, and raises the upper portion into the form of a meta as described by Pliny by employing other steep steps which were found on the site. The defect in his design lies in the abrupt change from one to the other. If the junction of the two sets of steps had been broken by plinths and antefixae, as in Cockerell's attic storey, or, better still, by pedestals carrying the famous lions,

105.—ENTABLATURE OF MAUSOLEUM AS SET UP IN THE BRITISH MUSEUM.

these would have masked the transit from the low to the high pitch of the pyramid. The tomb at Mylasa is of much smaller dimensions, but its pyramid still exists, and in a sense recalls Martial's description, as it is entirely supported by the columns and piers round, the angles being tied inside by diagonal beams of stone across the four corners. In the Nereid monument, also in the British Museum, may be studied another example of the substructure or podium on which such a tomb as that at Halicarnassus was raised, and the bands or friezes of sculpture with which it was decorated may be regarded as further evidence of the correctness of Cockerell's restoration. The structure carried on the podium in the Nereid monument was the reproduction of a small Ionic tetrastyle temple, but in the tomb at Mylasa just referred to, although it belongs to the Corinthian order, we find a monument which was apparently based on the design of the Mausoleum at Halicarnassus, and possessing the three divisions of podium, pteron, and pyramid. In consequence of the great weight which it has to carry there are square piers at the four angles, and the intermediate supports consist of semi-detached columns against a small central pier.

Though coming more within the range of sculpture than of architecture, the marble sarcophagi found at Sidon by Hamdy Bey, and now in the museum at Constantinople, are magnificent examples of the decorative sculpture of the Macedonian period, which in consequence of their good state of preservation show the extent to which polychromy was employed to enrich the elaborately carved mouldings.

Lycian Tombs.

There is still a large series of tombs to which as yet we have not referred, owing to the difficulty of determining their real chronological position, and also because, although they betray an apparently early origin, owing to the close imitation of wooden forms, a closer analysis of some of them shows that their design was largely influenced by the earlier stone architecture of the neighbouring Greek cities. This influence is clearly shown in the Lycian Ionic tombs, where the front of the tomb carved in the rock is copied from a portico-in-antis with Ionic columns: in fact, here a double transformation would appear to have taken place; the Lycians copied the earlier Greek stone temples in wood, and then reproduced these copies in their

rock-cut tombs. The entablature is composed of the double or triple fascia of the architrave, no frieze, but a range of projecting dentils which have no meaning seeing that they are crowned with a pediment. Dentils represent the ends of beams of squared timber laid side by side, which in the original hut carried the flat mud roof. Sometimes these beams are copies of unsquared logs, and their round ends are shown above the pillar of the Lion's

106.—TOMB OF PAYARA FOUND AT XANTHOS.

Gate at Mycenae. They do not seem to have been reproduced decoratively at any later period. The ends of the squared timbers, on the other hand, not only in Asia Minor but in Persia, were retained, and constitute as dentils one of the most important decorative characteristics of the Ionian and Persian styles; but they were reduced in dimensions, and were retained probably to give support to the projecting cornice. In the rock-cut tombs of Lycia, however, these dentils are of almost the same

107. THE CHORAGIC MONUMENT OF LYSICRATES AT ATHENS.

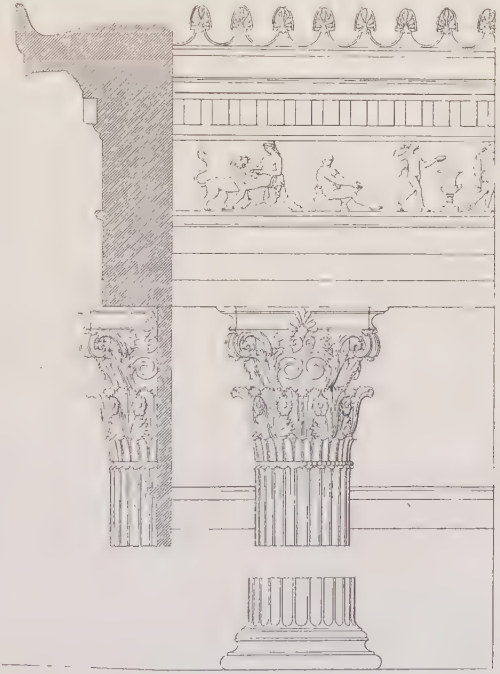
dimensions as the original wood beams they represent, and being cut in the rock the cornice needed no support. These tombs, which are found in the south of Asia Minor, in Caria, and in Lycia, exist in hundreds, and as a rule are cut in the sides of cliffs. Broadly speaking, there are three types. The first, direct copies of framed timber structures, those with the horizontal cornices being probably the oldest. The second type, some of which are rock-cut and some constructed, consist of a sarcophagus with pointed curvilinear roof, of which a fine example, the tomb of Payara (375—362 B.C.), found at Xanthos, is in the British Museum (Ill. 106). This sarcophagus is apparently copied from a portable ark or shrine, the staves or beams for carrying the same being carved in full relief. It rests on a double podium, the upper portion of which is carved with a sculptured frieze of figures. In the third type are the Lycian Ionic tombs already referred to, the principal examples of which are found at Xanthos, Telmessus, Myra, Pinara, and Antiphellus.

The Corinthian Order.

The only reference made by Pausanias to the Corinthian order occurs in a passage relating to the temple of Athena Alea at Tegea. From his description it has been assumed that the temple was of the Ionic order, and that inside the cella were columns of the Doric order, above which (or next to which) were columns of the Corinthian order. The researches made by Dr. Dörpfeld, however, in 1879, proved that the temple was of the Doric order, of which many of the drums were found, so that how the two other orders were utilised is not known, and no Ionic or Corinthian capitals were found on the site.

The best known example of the Greek Corinthian capital and its most perfected type is that which is found in the choragic Monument of Lysicrates (Ills. 107, 108), situated in the street of Tripods leading to the Dionysiac theatre in Athens. We have already referred to four examples of the order, viz., at Bassae, Olympia, Epidaurus, and Miletus. In all these examples the treatment of the leaves and tendrils is such as to suggest their having been copied in marble from metallic originals. Now Callimachus of Corinth is stated by Vitruvius to have invented this type of capital, and he was apparently not only a sculptor, but a worker in metal. He is recorded by Pausanias to have "made the golden lamps which hung in the temple of

Minerva Polias" at Athens, and probably "the bronze palm tree hanging over the lamp and reaching to the roof," and therefore may have originally worked his design in the Corinthian bronze or brass, which, according to Pliny, was held in the highest estimation by the ancients, thus accounting for the title given to the order. In further support of this theory, Pliny (xxxiv.) refers to a porticus built in Rome by Cn. Octavius (160 B.C.), which was called Corinthian from its *bronze Corinthian* capitals.

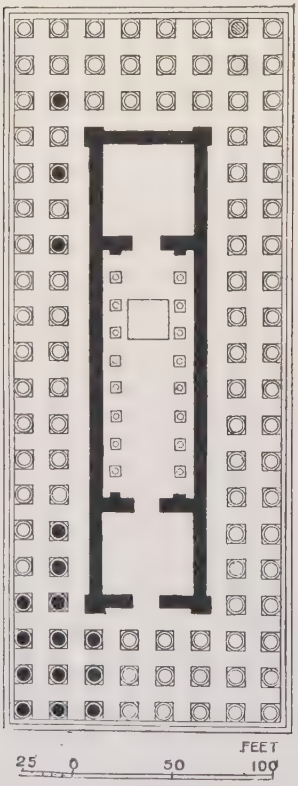


108.—THE CORINTHIAN ORDER OF THE CHORAGIC MONUMENT OF LYSICRATES AT ATHENS.

The capital of the Lysicrates monument is deeper than other examples, being one and a half diameters high, and the lower row of leaves are petals of some other plant, which are occasionally found in Greek sculpture alternating with the acanthus. The upper row of leaves of acanthus have between each leaf an eight-petalled flower or rosace, which, according to M. Choisy, was copied from the head of the pin which fastened the metal leaves to the bell or core of the capital. There is no annulet existing between the cap and shaft, but a sinking which suggests its having been in metal, and the flutings of the column terminate in leaves. This is found sometimes in votive columns, and we have already referred to this treatment in the capital from

109.—SCROLL FROM THE ROOF OF THE MONUMENT OF LYSICRATES.

Naucratis. The monument is circular, with six columns, and stands on a square plinth; walls filled in between the columns give them the appearance of being semi-detached, but the columns are complete: the filling-in was worked with a hollow to fit them. The entablature repeats the mouldings of the caryatide portico of the Erechtheum, but has a sculptured frieze. The antefixae, which usually form the termination of the tile-covering rolls, are here brought out in front of the corona, and carved as decorative features. The roof, which is in one block of marble, has its upper surface carved in imitation of bronze leaf tiles. In the centre rises the finial designed to carry the tripod, and from the base of the same are three helices, or scrolls (Ill. 109), which it is thought supported figures or dolphins. In the upper portion of this finial we recognise the further development of the design which we have already seen in the acanthus column at Delphi. Here, in addition to the acanthus leaves, we find the helix utilised to give variety and greater strength to the support of the tripod. This monument is the earliest example of the complex order in which we find the triple fascia of the architrave taken from the Ionic order, and a return to the dentil cornice of the Asia Minor examples, with less projection given to the dentils. The frieze, ten inches high, is carved with a representation of the story of Dionysus and the pirates, who being thrown into the sea become metamorphosed into dolphins.



110.—THE TEMPLE OF JUPITER OLYMPIUS AT ATHENS.

The next important example of the Order is that found in the great temple of Jupiter Olympius (Ills. 110, 111), situated in the plain to the south-east of the Acropolis at Athens. The temple was built partly on the foundations of an earlier Doric temple founded by Pisistratus. It was designed by Cossutius, a

III. THE TEMPLE OF JUPITER OLYMPIUS AT ATHENS.

Roman architect, and built by Antiochus Epiphanes in 174 B.C. Penrose's researches in 1884 proved the temple to have been octastyle, with twenty columns on the flanks. Its dimensions were 135 feet by 354 feet, and it was built in the centre of a peribolos measuring 424 feet by 680 feet. The temple was dipteral, viz., with two rows of columns on each side of the cella, and with three rows in front and rear. There was a deep pronaos, but no epinaos, and in the rear of the cella, and entered from it, was the opisthodomus. The temple as designed by Cossutius was left incomplete, and in 80 B.C. the monolith columns prepared for the cella, as also some of the capitals and drums of the peristyle, were transported by Sulla to Rome, and used to decorate the temple on the Capitol (see p. 129). The work was resumed in the time of Augustus, but its completion and dedication were reserved for Hadrian, 117 A.D.

112.—CAPITAL OF THE TEMPLE OF JUPITER OLYMPIUS AT ATHENS.

The temple is one of those described by Vitruvius as hypaethral, but we are left in doubt whether the whole of the cella was left uncovered or only its eastern portion in front of the pedestal destined for the statue of the god which was afterwards set up by Hadrian. In the latter case the columns of the cella may have been provided by him to carry the ceiling over the statue and the side aisles. There is of course no evidence that when completed by Hadrian any portion of the temple was hypaethral, because in the time of Vitruvius the cella, unprovided with columns, would have been too wide to roof over, as in the case of the Temple of Apollo Didymaeus. The diameter of the columns of the peristyle was six feet four inches, and their

height being fifty-six feet, gives a relation of diameter to height as 1 to 8·6, exclusive of the square plinth, an unusually solid proportion for the Corinthian order. According to Penrose, some of the capitals (Ill. 112) belong to the design by Cossutius, being much too pure in style to have been executed under Augustus, and still less in Hadrian's time. The carving of the foliage resembles more that of the capital in the Tholos of Epidaurus, than that found in the Archway close by and the Stoa, both built by Hadrian. The capitals, however, vary in their execution, so that the original design may have been copied in Hadrian's work. There are other Corinthian temples in Asia Minor, one at Euromus, near Yakli, illustrated as "Jackly" in volume I. of *The Ionian Antiquities* published by the Dilettanti Society, and as "Labranda" in Sir Charles Fellows's work on Asia Minor. The temple was hexastyle peripteral, with twelve columns on the flanks, and, as shown in Fellows's work, with nineteen columns still standing. Some of the columns have tablets worked on to them, with inscriptions recording the names of the donors, as in the case

113.—STELE IN THE NATIONAL MUSEUM AT ATHENS.

From a photograph by E. G. Spiers.]

Euros. Apeliotes. Kaikias. Boreas.

114.—THE TOWER OF THE WINDS AT ATHENS.

in the temples at Aphrodisias* and Mylasa. Of a second temple at Ancyra, which was hexastyle peripteral, only the

* *Vide* Ill. 103, page 118.

cella and pronaos remain; and there is a third at Sagallassus, of similar plan.

There is one other well-known example of the Corinthian order, though of later date, viz., that which is found in the two small porches of the Tower of the Winds at Athens. The bell of the capital is decorated with leaves similar to those found in the capital of the Monument of Lysicrates, with a single row of acanthus leaves round the base. Other examples of capitals of the same design were found during the excavations of the Theatre of Dionysus.

The porches of the Tower of the Winds at Athens, to which the capitals belonged, no longer exist, but the octagonal tower of marble, twenty-one feet in diameter and forty-four feet high, is still well preserved, and is not only a beautiful feature but one of the most characteristic buildings in Greece, the date of its erection being probably in the first half of the first century B.C.* On each side was sculptured a bas relief representing the wind blowing from the quarter facing it, and on the top of the roof was a huge Triton working on a pivot, with a rod in his hand which pointed to the figure of the quarter in which the wind lay. The two figures best seen in the illustration (No. 114) represent, on the left, Apeliotes, the east wind, showing fruit and flowers, and on the right, Kaikias, the north-east wind, holding a dish of olives. Within the tower was a water clock.

The favourite type of tombstone in Athens in later times is the vertical slab known as a stele. The example (Ill. 113) is now in the National Museum at Athens, and is probably one of many hundreds which lined the sacred way from Athens to Eleusis. The scenes represented in these sepulchral reliefs are generally of a domestic character. Here the husband seems to be bidding adieu to his wife, called away to another world.

* It is mentioned by Vitruvius (Bk. i., chap. 5) as having been built by Andronicus Cyrrhestes.

115.—SIMA IN PAINTED TERRA-COTTA FROM THE PHILIPPEUM AT OLYMPIA.

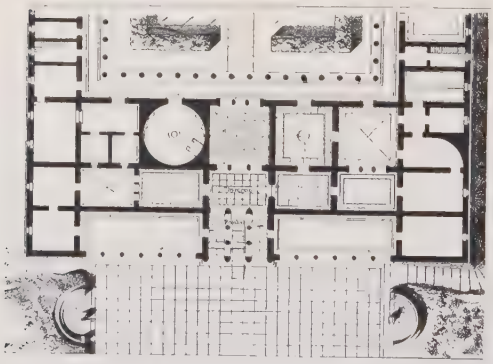
CHAPTER VII.

SECULAR ARCHITECTURE.

Of the typical arrangements of the Greek city, Delos and Priene afford the clearest evidence, and indicate a vastly different state of things from the primitive settlements of Troy and Tiryns.

The house of the wealthy living, and the resting-place of the noble dead, appear to have been the chief buildings of the Mycenaeans; but in all periods the dwelling-house of the Greeks must have been an unpretentious fabric. Viewed from without, it was of a simple nature, being designed only to shut out "the noise and rattle of the town," the chambers facing inwards to yards, and, in the more important houses, to peristyles. It must be remembered that the Greeks of every period spent their time mostly in the open air and in their places of public assembly, and that their climate failed to develop the home as a place of social intercourse. The house seems generally to have been of one storey, with walls of unburnt brick on a stone foundation, and flat-roofed; windows were absent, and the door opened on a comparatively narrow street. The examples lately discovered in Athens, Delos, and Priene are of very simple character, the usual features being a single courtyard, with an exedra facing the sun and sheltered from the winds, and one large room provided for feasts, with smaller rooms and offices round the court and lighted from it: in the

more important houses found in Delos and Priene a peristyle is carried round three sides of the courtyard. The first portion of the description given by Vitruvius (Bk. vii., chap. 10) of the Greek house is in accord with the remains found, except that he fails to recognise the atrium in the courtyard or peristyle. His description of the narrow passage leading from the street, with the patron's residence on one side and the stables on the other, is also true if in the place of stables we read offices. The writings of various authors also suggest that the ordinary Greek house was simply a residence to which the master of the house returned from his avocations in the city to take his meals and sleep, and that during the daytime it was left in the care of the chief matron of the establishment. The second portion of Vitruvius's description applies to the more luxurious additions which crept in at a later period, examples of which we find at Pompeii, but it becomes necessary to reverse the order he gives. In other words, that which Vitruvius calls the gynaeconitis, or women's quarter, should be transferred to the rear, and the atrium with its more sumptuous approach, and the exedra, tablinum, triclinium, and other halls, become the guest-chambers where the master of the house received his clients and supporters and entertained his guests. No examples are known to exist of Greek houses of this type, but the discoveries made by Messrs. Heuzey and Daumet near Palatitza, in Macedonia, have revealed the remains of a summer palace built about the middle of the fourth century B.C. (Ill. 116). The principal front of the palace, which faced the east, measured about two hundred and fifty feet. On either side of the principal entrance were spacious open porticoes of the Doric order. Three entrances in the centre led to the prothyrum, whose ceiling was carried by a double row of Ionic columns similar to those found in the



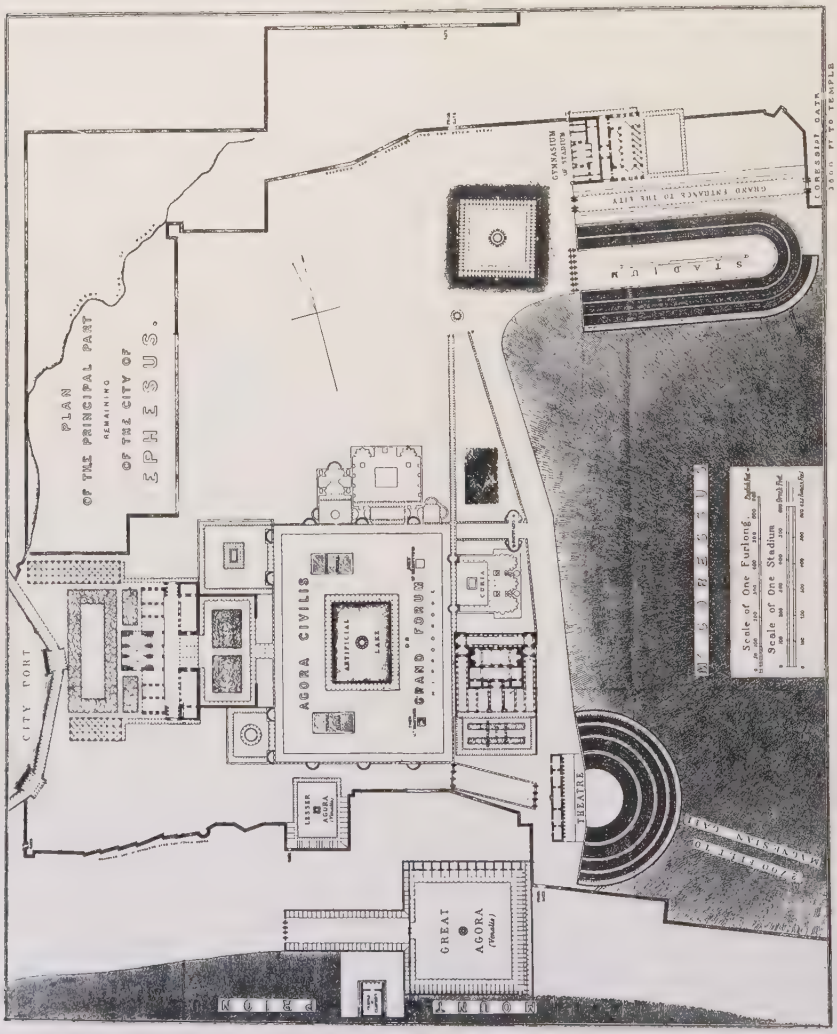
116.—PORTION OF THE PLAN OF THE PALACE AT PALATITZA, AS RESTORED BY M DAUMET.

Propylaea at Athens and Eleusis. Beyond this was an open court, with various halls to the right and left, and in front a Hall of Audience, which at one time was richly decorated with marbles. Passing through this, one entered an immense court, about two hundred feet wide, which was surrounded by a peristyle giving access on the north and south to various chambers, and on either side of the Hall of Audience to two great halls. The hall on the left or south side, which was circular, with a diameter of thirty-six feet, was decorated with marble, and in it the foundations of an altar or throne were found. This may have been the Prytaneum, originally the house or hall of the king or chief magistrate, where the foreign envoys or distinguished statesmen or generals were received and entertained. On the north side was a square hall, which opened on to a court farther north, and served for the entertainment of the king's guests, and this is made more probable by the position of the offices, kitchen, etc., found in the outer north wing of the building. To the south of the circular hall were the private apartments of the king. A conjectural restoration by M. Daumet of that portion of the palace of which the remains were found is published in the work by Messrs. Heuzey and Daumet (*Mission Archéologique de Macédoine*, 1876), from which Ill. 116 has been reproduced.

The simple and unpretentious character of the houses discovered at Delos and Priene is due to the fact that the Greeks would seem to have lavished their taste and skill on their public buildings, and it is of these that we speak, as a rule, when describing the architecture of Greece. To the temples, shrines, treasuries, stoas, and votive monuments enclosed within the sacred temenos we have already drawn attention, and we now come to the agora, or market-place, corresponding to the Roman forum, surrounded by its colonnades or peristyles, called Stoas. Adjoining the agora was the Bouleuterion, or meeting-place of the city council, arranged something like a small theatre. Then there was the great theatre, as a rule cut in the side of a hill; the Odeum, or music hall; the Gymnasium; Palaestra, and the Stadium.

It has already been pointed out, in speaking of the temples at Agrigentum, how the Greeks availed themselves of the resources of the site and wedded nature to art. This is illustrated in a remarkable manner at Delphi, where the enclosure forming the temenos was built on a rapid slope. To what extent the same

principles guided them in the planning of their towns it is difficult to say, owing to the paucity of examples remaining. Judging from remains found, all the principal points of

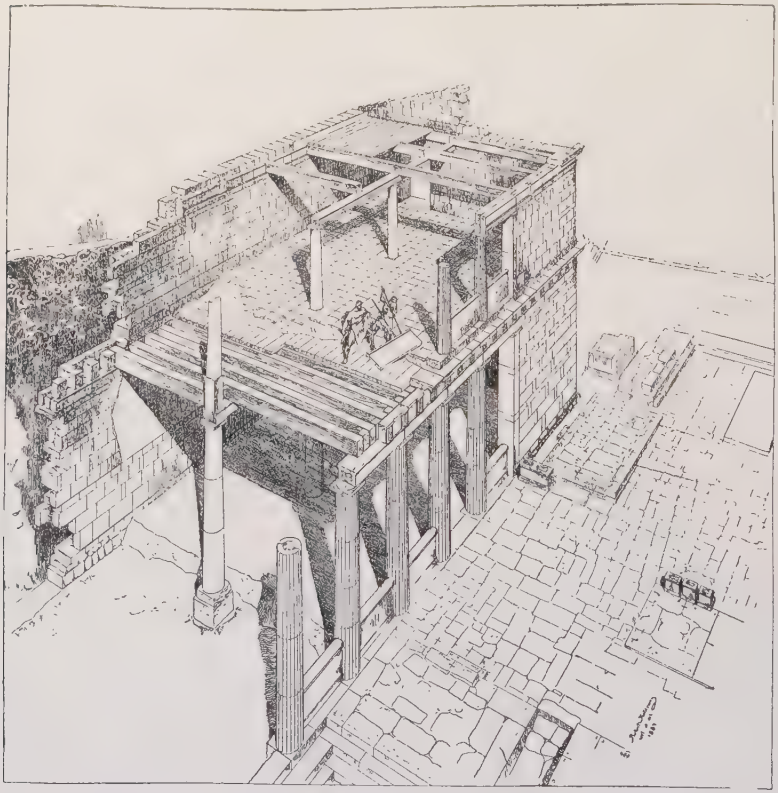


advantage would seem to have been devoted to the temples, with the exception of some of the early Mycenaean palaces at Tiryns, Troy, and Mycenae; but even these sites, when built on in later times, were given up to temples. Almost the only example of a town, the main lines of which have been discovered, is that of

Ephesus (Ill. 117, p. 134), which was measured by Falkener, the correctness of whose survey is attested by Wood, who before he made his discovery of the site of the Temple of Diana devoted some time to researches in the city. Although the actual remains found are Roman, Wood states that in many cases they were built on Greek foundations, many of which he found, though as a rule the Romans rarely trusted to old foundations, which they rooted up, building however on the same lines. We may therefore fairly assume that the general lines of the plan accord with the Greek city of Ephesus as laid out in the fourth century. Falkener also draws attention to the fact that the Ionians laid out their streets in straight lines, with cross streets at right angles to them, a custom which spread afterwards to the rest of Greece. The site of the Temple (not shown on the plan) was about seventy-five stadia, or four thousand two hundred feet, from the Coressian gate in a north-east direction, and Wood was led to its discovery by an inscription found in the Theatre stating that on the festival of the goddess the statues carried from the Temple were to be met by the Ephebi at the Magnesian gate and carried back through the Coressian gate. This would allow of the procession passing through the main thoroughfares of the town. The site of the Coressian gate was found on the north side of the acropolis, called Mount Priene by Falkener, but now corrected by Wood to Mount Coressus, Mount Priene being the crag or hill on the south side of the town. A covered portico extended from the Coressian gate to the Temple, and the discovery of its foundations, and of a road with deep-worn ruts in it, led Wood to the peribolos wall of the Temple, of which he was in search, when he was fortunate enough to find an inscription recording it to have been the enclosure built by Augustus.

The principal monuments of the town, of which sufficient remains were found by Falkener to form an important restoration, were: the Arsenal with its storehouses in front of the Port; the Agora Civilis, or grand forum, surrounded by peristyles and exedrae; two Agorae Venales, or markets; two Gymnasia, one by the Theatre, the other by the Stadium; the Theatre and Stadium both partially excavated in the sides of Mount Coressus; a square enclosure with a portico round, supposed to be the Serapion; and the traces of a colonnaded street between the Stadium and the Gymnasium leading up to the Coressian gate. The colonnaded

street is a feature which was found not only in Asia Minor, but throughout Syria. The remains now found belong only to the Roman period, but under the Seleucidae, from 300 to 167 B.C., the town of Antioch in Syria was laid out with wide colonnaded streets, crossing one another at right angles, the principal street, from east to west, being about two miles in length. The



118.—THE STOA AT ASSOS AS RESTORED BY ROBERT KOLDEWEY.

central avenue for carriage traffic was open to the sky; the side avenues, bordered with shops and houses, had flat roofs over them. Similar protection from the fierce tropical sun was afforded in Greece by the porticoes round the market-places and in the temple enclosures.

Agorae.

Among the principal Greek buildings were the agorae, which were of two kinds: firstly, those where the people assembled to

hear the decisions of their rulers; and secondly, the places of meeting for traffic and the transaction of public business. In both cases the agora consisted of a large open square surrounded by colonnades or stoas, in the former enriched with temples, fountains, and statues. In the immediate vicinity of this agora were the Bouleuterion, or senate-house; the Prytaneum, or guest-house; and the Basilica, or court of justice.

The second agora had shops and stalls round, and a fountain in the centre, unless, as at Elis, it served for other purposes. From Pausanias's description we gather that the central space at Elis, known as the Hippodrome, was used for training horses. On the south side was the Umpire's Hall, a porticus with four rows of columns, which divided it into three aisles. On the left was the Umpire's residence, separated by a street from the agora; on the right, similarly separated by a street from the agora, was a second porticus, the Stoa of the Hellanocidae, with a wall down the centre, so that there was a colonnade on each side. Nothing is said about paintings, but statues and pedestals stood against the wall on each side. The north or fourth side had probably another colonnade.

The architecture of the agora was of the simplest kind, and depended entirely for its effect on the ranges of columns which carried the roofs of these stoas. This is shown in the conjectural restoration by Robert Koldewey of the stoa at Assos (Ill. 118). Although the columns were in stone, the roofs they carried were always in wood, so that as the result of fires and earthquakes the foundation walls only have been found. There is one example of a stoa at Thoricus, in which instead of a central wall there was a row of columns. In two examples, at Alinda and Aegae, the agorae were formed on the slope of a hill, and terraces made to support them. Underneath the colonnade which overlooked the valley are buildings in two storeys, which are called market-houses by Texier. They may have been utilised for that purpose, but their primary object was the support of the terrace. As these substructures are Hellenic, and are almost the only examples of secular Greek architecture which have been preserved to our day, they are of considerable interest, as showing extreme simplicity of design with good solid construction.

The example at Alinda (Ill. 119) is three hundred and thirty-two feet long by forty-four feet wide. On the lower storey

is a corridor in the rear, sixteen feet wide, giving access to a series of rooms in the front, sixteen feet deep, some of which were lighted by windows, others through doorways opening on to a terrace. The upper storey consists of two long corridors, divided by a series of piers with semi-detached Doric columns facing one another. The floor dividing these two storeys has disappeared. This upper floor was lighted by narrow apertures at the top, in the front wall only. This substructure originally carried a stoa, whose roof was supported by a row of columns down the centre, and piers on each side or pedestals with a solid balustrade or dwarf wall of stone (five feet high) between; all this latter portion being of Roman date. The lower terrace is built on the natural rock, which is left unhewn (see Ill. 117). The main front of the superstructure, four feet thick and twenty-eight feet high, is built in coursed masonry crowned by an ogee string. The courses, nineteen in number, vary in height apparently as the masons found the blocks to hand, each being worked to a convex curve. The windows or smaller openings have deep architraves, the doorways voussoired arches. The example at Aegae is of similar design, with a front of two hundred and seventy-two feet, and a return wing eighty-four feet long. It is true that these buildings were only substructures to a porticus, but in themselves they have a fine monumental effect, their architectural embellishment, if it may be so called, being confined to the varied height of the courses of masonry and their bossed surfaces. The Greeks apparently trusted to this finely-worked masonry alone for the external aspect of their buildings. The walls at Cnidus are built with large polygonal blocks fitting accurately together, with

119.—SUBSTRUCTURE OF STOA AT ALINDA, ASIA MINOR.

drafted edges round each block. As these walls have a substructure of regular squared masonry, they probably date only from the third or fourth century B.C., and the selection of polygonal masonry (the idea of which may have been taken from earlier work) would seem to have been due to the fact that the Greeks recognised its decorative value. This simplicity of treatment lasted in Asia Minor even down to Roman times, and the rear wall of the theatre at Aspendus, measuring eighty feet high and three hundred and sixty feet long, has no other architectural embellishment than that of its drafted and rusticated masonry in courses of varying heights, the only Roman element which creeps in being the moulded archivolts of the ranges of arches in the upper portion of the wall.

Theatres.

Originally the theatre was designed for the performance of choral dances pertaining to the worship of Dionysus, but they soon obtained a much greater importance and popularity, and were used for a variety of purposes not always necessarily dramatic. Originally the stage was of wood, as were possibly the seats. A curved recess in an open hillside was nearly always excavated to form the auditorium, thus saving the great expense of raising a foundation for the upper seats, whilst some beautiful prospect was sought for as a background. The wall at the back may first have become necessary for acoustic reasons, but was used for displaying the scenes, until it became usual about 150 B.C. to have an unvarying street scene, when this part was made a separate stage building. Three parts may thus be specified—the orchestra, forming at Epidaurus a complete circle (but at a later period encroached upon by the bringing forward of the stage); the cavea, or auditorium for the spectators; and the stage. The height of the stage is a contested subject. At Epidaurus it formed a platform eleven or twelve feet high, and was decorated with three-quarter detached columns, and reached by flights of steps in the centre and at the sides. In later times, and as found in the reconstructed Theatre of Dionysus at Athens, the stage is about four feet high and described as the logeion or speaking place, and a permanent stone proscenium decorated with columns was built at the back. Throughout Asia Minor the Roman theatres possess this proscenium, which forms an

important architectural feature, with sometimes two tiers of columns. The orchestra was the scene of the dance, and in the centre was the altar of Dionysus, round which the chorus danced. Traces have been found in the Theatre at Athens of the original orchestra, which, like that at Epidaurus, formed a complete circle. The seats immediately round the orchestra are sometimes in marble, with backs shaped like the chairs of the early Victorian period. It is so in the Theatre of Dionysus at Athens, where there are sixty-seven marble chairs inscribed with the names of the priests or other dignitaries who occupied them (Ill. 120).

120.—CHAIR OF THE HIGH PRIEST IN THE THEATRE OF DIONYSUS AT ATHENS.

The finest theatre, and one of the best preserved, is that at Epidaurus (Ill. 121), with a diameter of four hundred and fifteen feet; the largest was that of Megalopolis, with an auditorium four hundred and seventy-four feet in diameter. Other Greek examples exist at Syracuse, at Segesta in Sicily, dating from the fifth century B.C., at Dodona in Greece, and Pergamum and Tralles in Asia Minor.

Dating from the Roman period, but still retaining much of the traditional arrangement of the Greek theatre, are a large number of theatres in Asia Minor, two of which, Aspendus (see Ill. 190, p. 233) and Perga, were, when first discovered by Sir Charles Fellows in 1840, almost complete, the former retaining the gallery which ran round the upper part of the theatre. The walls of the proscenium, with the three doorways leading

on to the stage, and enriched by pilasters or detached columns, are in many cases found in sufficient preservation to allow of their complete conjectural restoration. Other theatres are found at Hierapolis, Myra (with composite capitals in the proscenium), Patara, Aegae, Alinda, Ephesus (four hundred and ninety-three feet in diameter), Laodicea-ad-Lycum, Magnesia, Telmissus, Termessus, Pinara, Side, Assos, all in Asia Minor, Taormina in Sicily (Ill. 122), etc.

121.—THE THEATRE AT EPIDAURUS.

The Odeum or Music Hall.

No Greek example exists of the odeum. The one mentioned by Pausanias as near the Theatre of Dionysus, and said by him to have been made in imitation of the tent of Xerxes, is thus described by Plutarch: "The odeum, built under the supervision of Pericles, has many seats and pillars within; the roof was made slanting and converging to one point, and they say it was after the model and as an imitation of the king of Persia's tent." Vitruvius also mentions "the odeum as you go out at the left side of the theatre." It was restored after

the sack of Athens by Sulla, and (as stated by Pausanias) according to the original design. Its position, near to the Theatre, suggests that it was used for rehearsals and musical contests, the latter introduced by Pericles, "who gave instruction to the performers, whether singers or players on the flute."*

Palaestrae and Gymnasia.

The former term was given to those establishments where boys were trained in athletic pursuits; the latter were reserved

122.—THEATRE AT TAORMINA IN SICILY.

for adults. The palaestra at Olympia consisted of a large open court with a Doric peristyle round, and, on one or more sides, of a series of rooms for exercises under cover, dressing-rooms, baths, etc. The gymnasia would appear to have been the prototype of the Roman Thermae, except that they were built for gymnastic exercises of various kinds, the baths being of less importance. Of the gymnasium at Olympia, which must have been an establishment of considerable importance, the great double-aisled porticus (six hundred and sixty feet long), on the

* *Mythology and Monuments of Ancient Athens*, by Jane E. Harrison.

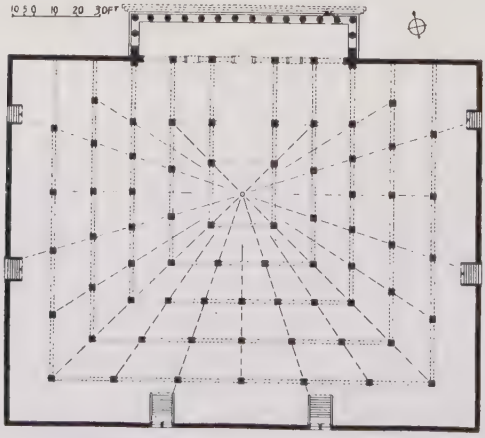
east side only, has been excavated. The examples at Ephesus and Alexandra Troas, which are of Roman date, do not agree with Vitruvius's description, which seems to accord better with the Greek palaestra. The gymnasium of the Theatre at Ephesus was surrounded on three sides with a covered corridor (Diaulos), thirty feet wide, in the centre of which were the various halls connected with the baths, the series of halls on the south side being for various exercises and games, as in the Roman Thermae. The xystus, also on the south side, was surrounded with a porticus. In the gymnasium of the Stadium there do not appear to have been any baths, and the eastern half, with its corridor thirty-six feet wide, round a small central court, may have served as the diaulos.

The Stadium.

The stadium was an elongated space six hundred to nine hundred feet long, the site for which, like that of the theatre, was selected close to the side of a hill, so that, at all events on one side only, would it be necessary to build up an embankment. At Messene it was built in a narrow valley, and at the end where the goal was placed there were colonnades in the form of a semicircle; and at Aphrodisias a similar arrangement existed at each end. The oldest stadium in Greece was probably that at Olympia, six hundred and thirty feet long; the entrance to it from the Altis is through a passage one hundred feet long and thirteen feet wide, carried under the west embankment of the stadium, and covered over with a stone barrel-vault, which is considered to date from the third century, showing that the Greeks were well acquainted with the arched vault, and employed the same where, as in this case, it received ample abutment from the ground on each side. The Panathenaic stadium at Athens, six hundred and seventy feet long, was constructed in 330 B.C. by the Greek citizen Lycurgus, and was built of poros stone. At a later date, about 160 A.D., it was reconstructed by Herodes Atticus in Pentelic marble. The largest stadium, but built in Roman times, was that at Laodicea-ad-Lycum, in Asia Minor, which was one thousand feet long, with semicircular terminations at each end. At Perga a colonnaded gallery seven hundred and seventy feet long was carried round above the seats; here, as at Magnesia and Aizani, the stadia were built on

level ground. The Stadium at Ephesus was eight hundred feet long, cut in the hill on one side and enclosed with masonry on the other. It will be noticed (see plan, Ill. 117, p. 134) that an additional tier of seats was built on the hillside: this irregularity is found in other examples, and may have been intended here, as Falkener suggests, to give a more monumental appearance to those who entered the town through the Coressian gate.

One other Greek secular building might here be mentioned, viz., the Thersilion or Assembly Hall of the ten thousand Arcadians at Megalopolis (Ill. 123). The plans, published in 1890 by the Hellenic Society, show that the hall covered an area of thirty-five thousand square feet, and the columns which carried its roof were on three sides of the hall, ranged in lines which radiated towards the Tribune, so as to form the least possible obstruction to the view from any portion of the hall. No architectural features were found, but the bases of the columns which remained *in-situ* proved by their respective levels that the floor of the Assembly Hall sloped downwards towards the Tribune.



123.—RESTORED PLAN OF THE THERSILION.

CHRONOLOGICAL MEMORANDA

RELATING TO

CHAPTERS VIII.—XV.

12th Centy.	B.C.	Migration from Asia Minor into Etruria.
616	,,	Tarquinius Priscus builds Cloaca Maxima.
509	,,	Republic established.
330	,,	Etruria becomes subject to Rome.
272	,,	Supremacy of Rome in Italy.
241	,,	Sicily annexed by Rome.
146	,,	Destruction of Carthage and Corinth.
86	,,	Sulla captures the Piraeus and Athens.
78	,,	Tabularium built by Catullus.
31 B.C.–14	A.D.	Augustus builds temples at Rome.
c. 25	B.C.	Vitruvius dedicates his book to Augustus.
23	B.C.	Theatre of Marcellus built.
31—13	B.C.	Portico of Pantheon and Thermae built by Agrippa.
64	A.D.	Burning and rebuilding of Rome by Nero.
70	,,	Colosseum commenced.
79	,,	Destruction of Pompeii and Herculaneum.
82	,,	Arch of Titus erected.
98	,,	Ulpian basilica built by Trajan.
117—130	,,	Temple of Venus and Rome at Rome built and Temple of Jupiter Olympius at Athens completed and dedicated by Hadrian.
138—161	,,	Antoninus Pius builds Baalbec.
194	,,	Arch of Septimius Severus built.
211—217	,,	Thermae of Caracalla built.
304	,,	Palace at Spalato built by Diocletian.
306—312	,,	Maxentius commences basilica completed by Constantine.
328	,,	Transfer of Empire to Byzantium (Constantinople).

124.—FRIEZE FROM THE ARCH OF AUGUSTUS AT PERUGIA.

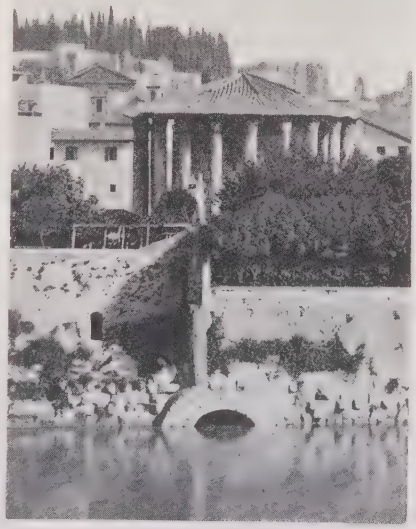
CHAPTER VIII.

ETRUSCAN ARCHITECTURE.

THE well-defined outline of the Italian peninsula would incline one to suppose that it had always been regarded as a single country, and that it must have generally possessed the political as well as the geographical unity it so well presents. But we have already seen that its southern shores were colonised by Greeks, who founded and raised many great cities, such as Paestum, Tarentum, etc. The time of their appearance in Italy almost coincides with the accepted date for the founding of the city of Rome (753 B.C.), and at this time there may be said to have been at least three divisions of the inhabitants of the peninsula in addition to the Greek colonists: (1) The Oscan and Sabellia tribes (generally the inhabitants of lower and central Italy, and from whom the Romans sprang); (2) the Etruscans, the tribe occupying the land between the Tiber and the Arno; and (3) the Gauls, who peopled the country north of the Arno.

The earliest remains found are the tumuli erected over the graves of the dead. One of these, the Regulini Galeasi tomb, at Caere (Cervetri), with its small inner chamber covered with horizontal courses of stone projecting one over the other, and surmounted by a pyramid with a podium or base round, bears so close a resemblance to the tomb of Tantalus on the north side of the Gulf of Smyrna, as to lead Fergusson to say (in speaking

of this and other tombs in the vicinity), "They seem as if left there opportunely to authenticate the tradition of the Etruscans having sailed from this port for Italy." Be this as it may, we are still at a loss to trace from whom they derived that which constitutes the most important architectural feature in their works, viz., the arch and vault with regular voussoirs in stone. The arch itself, both round and pointed, dates from time immemorial; and Professor Flinders Petrie's discovery at Dendera, in Egypt, of passages six feet wide, covered with barrel vaults of three rings of voussoirs built in crude brick, and dating from 3500 B.C., shows that, as a method of construction, the arched vault must have been one of the earliest known methods of covering over space. The employment of stone, however, and the working of the same in regular voussoirs, indicates a much higher state of civilisation, and when we note that these voussoirs sometimes measured from five to six feet in height, as in the canal on the Marta at Graviscae, it suggests that some centuries must have elapsed before the masons could have acquired such knowledge of stereotomy. This canal is supposed to precede by about a century the well-known example of the Cloaca Maxima at Rome, dating from the commencement of the sixth century. The Cloaca Maxima (Ill. 125) is a barrel-vaulted sewer which was constructed to drain the Forum and other valleys. It is about eleven feet wide, from twelve to fourteen feet high, and the vault is built with three concentric rings of voussoirs, each ring being about two feet six inches in height. Built underground, these and other similar



125.—THE MOUTH OF THE CLOACA MAXIMA AT ROME.

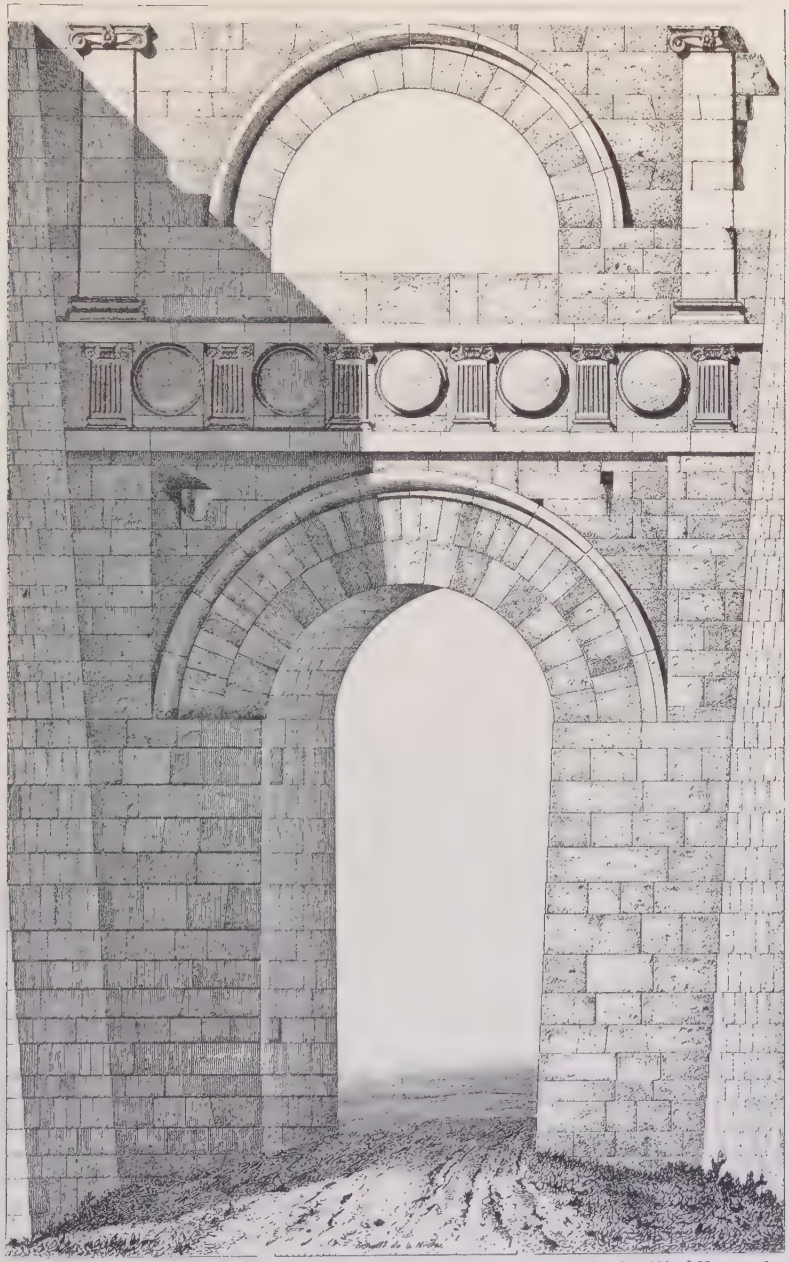
vaults possessed ample abutment; but in the case of the entrance gateways to their towns, such as those at Volterra, Falerii, Fiesole, Alatri, and Perugia, the Etruscans trusted to the abutment of the walls in which they were built. It is curious to note that, at the same period in which they were employing arched vaults, they also followed the old Pelasgian system of the employment of horizontal courses corbelled out as in the aqueduct at Tusculum. The same variety occurs in the masonry of their walls; sometimes it is cyclopean or polygonal, and sometimes squared stone.

The Arch of Augustus at Perugia (Ill. 126), so called because it was restored by Augustus * after the destruction of the town by fire in B.C. 40, is the finest Etruscan archway existing. It is built in large blocks of travertine laid without cement, and is remarkable, not only for the beauty of its masonry, but for the knowledge in stereotomy displayed in the voussoirs of the oblique arch. The frieze above the archway (Ill. 124) consists of Ionic dwarf pilasters with circular medallions between, and was apparently inspired by the triglyph frieze of the Doric order.

The most important architectural remains left of Etruscan work are found in their tombs, which are of two kinds: (1) Those consisting of immense tumuli, one of which, at Poggio Cajella, near Chiusi, measures eight hundred and forty-five feet in circumference; the chamber inside being of small dimensions, containing stone benches on which the bodies were laid, and also the relics of the deceased. These chambers were covered over with horizontal courses of stone corbelled out one over the other, and afterwards cut to a single curve each side. (2) Rock-cut tombs. In these, where any width of span could be obtained, the ceilings were carved in imitation of the house in which the occupant lived; and it is from them we obtain an insight into the domestic architecture of Etruria.

The principal chamber in a tomb at Corneto probably represents the atrium of an Etruscan house (Ill. 127), which corresponds to the description given in Vitruvius (vi. 3) of the simpler type of the Roman atrium, viz., the "cavaedia displuviata," in which there was an opening at the top, the roof sloping down towards the sides. The rafters which carried the roof are copied on the ceiling, which slopes down on each side. Similar reproductions of the timbers of the roof are shown in

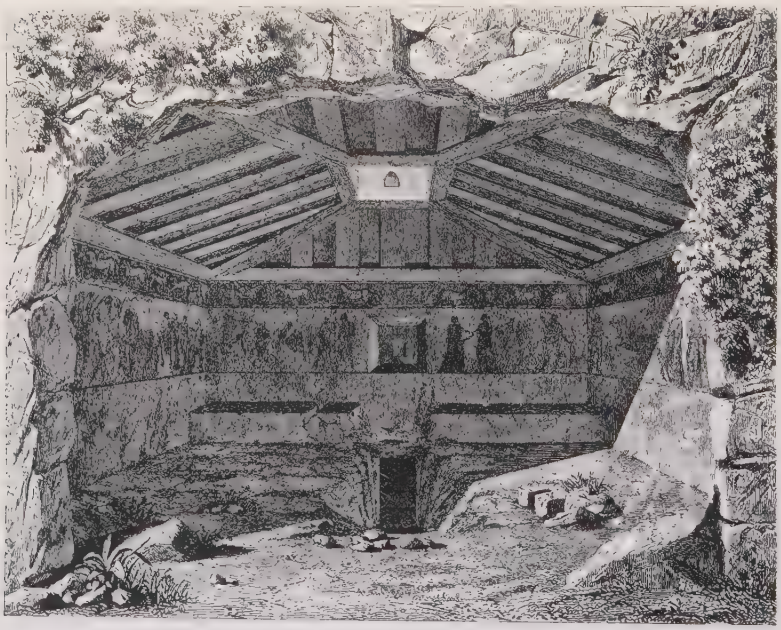
* The upper storey, above the frieze, was added by Augustus.



[*From an engraving by Alfred Normand.*

126. THE ARCH OF AUGUSTUS AT PERUGIA.

other tombs at Cervetri: in one instance, a flat roof or ceiling with joists; in a second, with a central ridge across the room, the rafters sloping down on each side. In another well-known tomb (also at Cervetri), additional support to the roof is given by square piers with volute capitals. In this tomb are recesses in the wall which suggest the chambers round the atrium, and are here utilised as cubicles for the dead bodies; whilst the



127.—INTERIOR OF TOMB AT CORNETO.

walls and piers are carved with representations of the household utensils, weapons, etc., as they might have been hanging in the house.

The most important decorations in the Etruscan tombs are the friezes, with figures in procession or dancing, painted in bright colours, but conventionalised in a manner suggestive of the treatment found on Greek vases.

In consequence of the almost entire disappearance of the foundations of any of the Etruscan temples, our knowledge of their plan and design has hitherto been confined to the somewhat meagre description of Vitruvius, who makes no mention

of the terra-cotta cornices, antefixae and pendant slabs, of which so large a collection has at various times been found and stored in museums. The discoveries made within the last fifteen years in Civita Lavinia, or Lanuvium, in Civita Castellana, and in Luna, of the remains of important Etruscan temples, which are now to be found in the British Museum, in the Museum of the Villa Papa Giulio at Rome, and in the National Museum at Florence, have thrown therefore additional light on the decorative treatment of the roof of Etruscan temples. We have already, under Greek architecture, referred to the ancient Greek custom of protecting the exposed parts of the cornice and entablature with terra-cotta slabs richly decorated with colour. The similarity of the terra-cotta slabs found in Italy shows that the Etruscans adopted the same methods of protection for the timber portion of the roof, except that they modelled in relief (as well as painted) the terra-cotta slabs. There are, however, two features which, as far as we know, are not found in Greece, the first being the pendant slabs which were affixed to the widely-projecting eaves, apparently to afford protection to the walls of the cella, which was not, as in Greece, surrounded with a peristyle, and the second a cresting above the cymatium of the pediment. This cresting is shown in bas-reliefs representing the Temple of Jupiter Capitolinus, referred to on page 156. The pendant slabs in the British Museum from Lanuvium have the lower part moulded like a hanging fringe, and are decorated in relief and in colour at the back, showing that they were exposed to view below the soffit of the projecting eaves. These were put together by Dr. Murray in the British Museum, and served to give some idea of the magnificent effect which these richly-coloured decorative features displayed in the Etruscan temple. From the description given by Vitruvius (IV. 7), it would seem that the roof of the Etruscan temple had a pediment on the front only, the other three sides projecting over and forming eaves, and round these were hung the pendant slabs. It is not known whether they extended across the front, where there would be no need for them with the portico behind, and they would also there interfere with the lighting of the cella through the door. Further information is required also as to the way in which the bold cavetto mouldings of the pediment terminated at the angles.

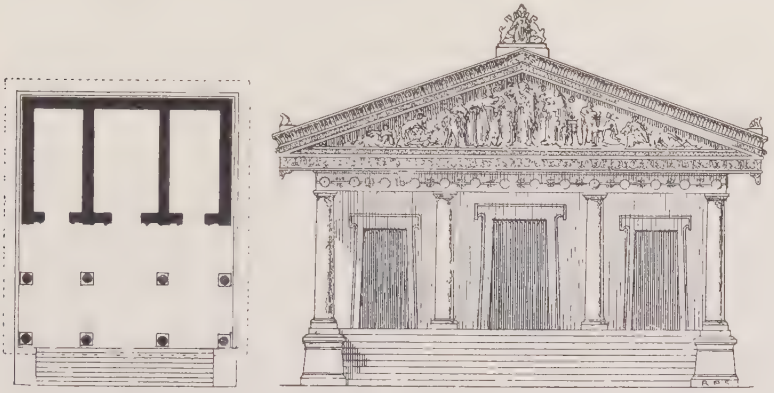
Vitruvius (III. 2), speaking of the araeostylar temples, in which the architraves were of wood, states, "the different species of temples of this sort are clumsy, heavy-roofed, low and wide, and their pediments are usually ornamented with statues of clay or brass, gilt in the Tuscan fashion." At Civita Castellana (the ancient Falerii) four fragments of figures in high relief on terra-cotta slabs were found,* and the holes in the latter showed that they were nailed to a wooden framework. These and the terra-cotta pediments, cornices, and pendant slabs suggest that the whole of the timber structure of the roof of an Etruscan temple was protected in the same way as the Treasury of Gela at Olympia, to which reference was made in Chapter V. (p. 103); in the latter case the traditional custom extending even to the protection of the stone entablature.

In the larger rock-cut tomb at Norchia the horizontal corona of the pediment is shown curved upwards at each end, resembling a reversed volute, the centre of which is carved with a head, and the cavetto cornice dies into the top of this volute. On the upper surface of the pediment cornices in the museums of Rome and Florence there is a sinking about two inches deep, which apparently held a cresting of pierced terra-cotta work; and in the representations on coins, and in the bas-relief of the Temple of Jupiter Capitolinus now in the Palazzo dei Conservatori at Rome, a similar cresting is reproduced, which shows that it was a recognised feature in some Etruscan temples.

Two of the Etruscan temples in Rome referred to by Vitruvius are those of Jupiter Capitolinus, on the Capitol, and of Ceres in the Forum Boarium. In both of these cases the portico would seem to have consisted of columns only, but in the larger rock-cut temple-front at Norchia the angle supports are piers, which show either that the front of the primitive temple consisted of four columns-in-antis—that is to say, the angle piers were the ends of the cella walls—or that for the sake of greater strength (requisite in the case of an Etruscan temple on account of the wide spacing of the columns) the angle supports consisted of square piers. In the tomb of the Tarquinii at Cervetri the square pier is surmounted by a strongly-developed cavetto capital, such as could only crown a square

* The same description applies to those found at Luna and Telamon, now in the museum at Florence.

pier. This, however, is not the only type of capital found in the tombs; there is a second variety, in which volutes form the chief decoration; not the constructional volute of the Greek Ionic capital, but the decorative example such as is



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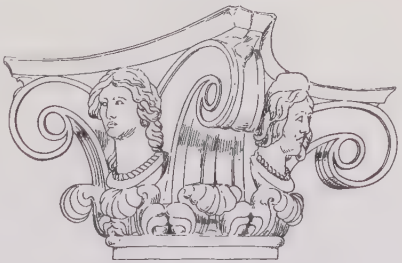
128.—CONJECTURAL RESTORATION OF AN ETRUSCAN TEMPLE.

found in those from Cyprus. In the case of pilasters the lower part of the capital, below the cushion, is decorated at the angles with the anthemion ornament.

There is a second type of Ionic capital in the gateway at Perugia (Ill. 124), which is probably a later development of the Greek Ionic volute. The dwarf pilasters which subdivide the decorative frieze above the gateway at Perugia have capitals in which a tendril supporting the anthemion rises between the volute and the egg and tongue moulding. In the capitals which crown the pilasters on each side of the arched opening above this frieze the egg and tongue is omitted, and a flower decorates the centre of the capital.



129.—CAPITAL OF A COLUMN SUPPORTING THE CEILING OF A TOMB AT VULCI.

A further development of this capital, designed for a circular column, is found throughout Etruria, in which the volutes, still of Cyprian design, are more fully developed. Between them,

on each face, is a head in full relief, and around the base of the capital a range of eight leaves (Ill. 129).

In the conjectural restoration of an Etruscan temple (Ill. 128) the description of Vitruvius has been followed so far as the plan and timber construction of the roof is concerned, and for the protection of the latter the remains found at Lanuvium have been incorporated. In the museum at Florence are portions of the figures decorating the pediment of an Etruscan temple, upon which, and upon those of the Tomb of Norchia, the drawing is based. It is generally assumed that the podium of the Roman temple was derived from that of the Etruscan temple, as the comparatively low elevation of the latter seemed to require some such raised platform to give it more dignity.

130.—A TERRA-COTTA ANTEFIX.

131.—PORTION OF THE FRIEZE OF TRAJAN'S BASILICA.

CHAPTER IX.

EARLY WORK IN ROME.

THE rebuilding of Rome which commenced in the reign of Augustus, and was carried on by his successors to a much greater extent, has caused the destruction of all those examples of the earlier developments to which the student would turn in order to work out the history of a style. So far as the orders are concerned, the Roman architects were content to adapt to their own taste and requirements the forms evolved by the Greeks, but showing a marked preference for the Corinthian Order, which occurs more frequently in their temples than either the Doric or Ionic Orders. The tendency to debasement, which has already been noticed in the later examples of Greek work in Asia Minor, was carried still further by the Romans, except so far as the more complete development of the Corinthian capital was concerned. In the plans of their temples, the Romans seemed to have made a compromise between the Greek and the Etruscan: from the former they borrowed the peristyle, from the latter they derived the raised platform (which may have been deemed necessary in a town to give a greater importance to the temple), the triple cella and the far greater depth given to the front portico. The description of an Etruscan temple given by Vitruvius (iv. 5) was

probably derived from the Temple of Ceres, built 494 B.C.; and in the several rebuildings of the Temple of Jupiter Capitolinus the original plan was apparently adhered to. It is from the frequent descriptions of these latter, given by various writers, and in the representation of the great Temple in bas-reliefs and on coins, that a clearer idea of the main features of its design can be derived, than from the meagre account given by Vitruvius.

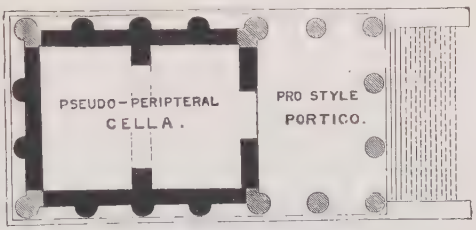
The Temple of Jupiter Capitolinus was the principal building on the Capitoline Hill, the summit of which, even in Republican times, was occupied by a large number of temples and shrines, with countless statues and other works of art (principally the spoils of Hellenic cities), which must have produced an effect of great splendour.

The first Temple of Jupiter was founded by Tarquin I., and completed by his son, the consecration taking place in 509 B.C. This temple was burnt in the year 83 B.C., and reconstructed on the same plan by Sulla in the following year. It was Etruscan in plan, with wide intercolumniations, carrying an entablature in wood; this was probably protected by terra-cotta slabs similar to those already described in the temple at Lanuvium. The pediment was filled with terra-cotta statues, and on the summit carried a quadriga in terra-cotta. This second temple was burnt in 70 A.D., rebuilt by Vespasian on the old plan, but of increased height; and burnt again ten years later. The fourth temple was built by Domitian with increased splendour, and with Corinthian columns of Pentelic marble.* The original temple is considered to have been tetrastyle, with three cellae at the back. At what period the front was made hexastyle (by the addition of a peristyle on each side) is not known. A representation of the temple on a bas-relief from the Arch of Marcus Aurelius, now in the Palazzo dei Conservatori, shows the pediment filled with sculpture, with a representation of the famous terra-cotta quadriga (originally made at Veii for Tarquinius Superbus) on its summit, and a rich cresting rising above the pediment on each side, which recalls the terra-cotta examples now in the museums of Florence and

* In 1875 an enormous drum, nearly seven feet in diameter, of a fluted column in Pentelic marble was discovered on the Capitoline platform, which, according to Dr. Middleton, can only have belonged to this temple.—Vide *Remains of Ancient Rome*, p. 365.

the Papa Giulio at Rome. A similar cresting is shown on some of the coins representing this temple; and as it is not found in the representations of any other examples, we may assume that such decoration was confined to Etruscan temples.

We have dwelt on this subject here at length to show the type of plan which must have influenced the Roman architect; though this was not always necessarily strictly adhered to, as is evidenced by three other temples side by side, portions of which still remain embedded in the Church of S. Niccolo-in-Carcere. All these temples were mounted on platforms, necessitated perhaps by their close juxtaposition. Two of them were peristylar, the third having no peristyle in the rear. The latter and the Central Temple were of the Ionic Order, and the right-hand temple of the Doric Order, suggested by the closer juxtaposition of the angle columns as shown in the *marble plan*,* so that the triglyph might come to the angle. The temples date from about 200 B.C., but may have been restored at a later period. Three fluted Ionic columns of the central temple stand in the façade of the church, with their entablature; others and those of the two other temples are known from drawings only, being now embedded in the walls of the church.



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132.—PLAN OF THE TEMPLE OF FORTUNA VIRILIS (FORS FORTUNA).

There is, however, one fine and complete example still existing of an early Ionic temple, viz., that of Fortuna-Virilis (Ill. 132), tetrastyle-pseudoperipteral, with a portico two

* The marble plan referred to was made during the reign of Severus, 222–235 A.D., being engraved on slabs of marble. A large portion of it was found in the sixteenth century and placed in the Capitoline Museum. In 1867–68 other fragments were found in the courtyard of the Church of SS. Cosmas and Damianus at the foot of a lofty wall of the third century, in which, at regular intervals, were small bronze holdfasts by which the marble slabs were held. The city was first surveyed in the time of Augustus, and a plan in colour on plaster was drawn on the walls of the Porticus Vipsania in the Campus Martius. After its destruction by fire a second plan was made by Vespasian and placed on the walls of the Temple "Sacrae Urbis." This was also destroyed by fire in 191 A.D., and Severus's *marble plan* was affixed on the outer wall of the same temple, being protected either by a projecting cornice or a portico. Since 1903 all the fragments of the plan have been transferred and set up in the garden of the Conservatori Palace.

columns deep and raised on a podium. The purity of the mouldings and carved decoration suggest their being the work of a Greek artist, and its date is ascribed to the early part of the first century B.C., being built on the site of an earlier temple founded by Servius. The employment of the engaged columns to decorate the walls of the cella of this temple (Ill. 133) is not necessarily a Roman invention, as we have already

133.—THE TEMPLE OF FORTUNA-VIRILIS AT ROME.

referred to examples in Greece, the two most notable ones being the great Temple of Jupiter at Agrigentum, and the Choragic monument of Lysicrates. In the first case, however, the immense size of the temple and the width of the space between the columns required it; and in the second case, as already noted, the shafts of the columns are complete, with screen-walls worked in between. There are, moreover, three other examples already referred to, viz., the Temple of Aesculapius at Agrigentum, probably inspired by the first-named, the

Temple of Serapis at Taormina, and the Propylaea at Priene, all however being of later date. The decoration of a blank wall with engaged columns, such as is found in most of the Roman pseudo-peripteral temples, was, as a rule, quite at variance with the principles of Greek architecture, though it was probably adopted by the Romans for two reasons: firstly, to save the space required for a peristyle in a crowded city; and secondly, to give more space inside the cella to provide room for the numerous statues and works of art brought over from Greece.

The earliest secular building still existing of the Republican period is the Tabularium,* built by Catullus in the year 78 B.C. It was built up against the Capitoline Hill, portions of which were cut away for the purpose. The substructure consisted of an immense wall built battering on its outer face, each course of the peperino stone, with which it was faced, receding one inch behind the face of the course below. The stones were respectively four feet long, two feet high, and two feet deep, laid in alternate courses of header and stretcher with a thin layer of mortar in all the joints. At a height of thirty-six feet from the ground was an arcade running from one end to the other, and forming a public passage from one summit of the Capitol to the other. This passage was lighted by a series of arches opening towards the forum, with intermediate engaged Doric columns, carrying an entablature (of which the architrave only exists), the earliest example of this use of the orders which in later times became universal. Poggio, an Italian writer, says that in his time (fifteenth century) there was another storey above this. A row of rooms opened into the public arcade, and at a higher level in the rear was an immense hall roofed with concrete quadripartite vaulting supported on piers. It is not certain whether this hall dates from the early period; if so, it would be the earliest example of quadripartite concrete vaulting known in Rome. A staircase from the forum through a doorway led to this hall, which was blocked up when Domitian built the Temple of Vespasian. The doorway was square-headed, with a flat arch of travertine, and a semicircular relieving arch above. A fragment of the Forum Julium, built 47 B.C., on the north side of the Tabularium, still exists, in which the same disposition of flat arch and semicircular relieving arch is found, the courses of masonry varying

* See Ill. 157, p. 190.

somewhat in height and the face of each stone being bossed or rusticated.

Apart from the temples and porticoes, the public monuments of Rome, prior to the Augustan era, for architectural effect depended more on their superb masonry than on any decorative treatment, and the arcade of the Tabularium is the first example (with the exception of the pseudo-peripteral temple of Fortuna-Virilis) in which the purely decorative application of the orders was resorted to to enrich the wall surface. The Theatre of Pompey, 55 B.C., is said to have been decorated externally with three ranges of superposed arcades; but, as it was virtually rebuilt on two or three occasions, it is not known if the earlier decoration was copied in its reconstruction. Its design resembled that of the Theatre of Marcellus, which comes within the Augustan era.

For the reasons given in the first paragraph of this chapter the few examples quoted or described give probably only a poor idea of the earlier developments of Roman architecture. Already at the commencement of the second century B.C. the direct influence of Greece was shown in the transformation of the Forum by Fulvius Nobilior, and, in imitation of the Emporium at Athens, Aemilius Paullus erected a similar structure by the Tiber and lined the quays with stone. The first basilica, that built by the elder Cato, 184 B.C., consisted (like the Greek agora) of an open space surrounded by porticoes. Adjoining it was a second basilica built in 179 B.C. by Fulvius and Aemilius Lepidus. This was rebuilt 50 B.C. by Paulus Aemilius, and was remarkable for its monolithic columns of pavonazetto. In addition to these public monuments, palatial residences of importance were built on the Palatine Hill overlooking the Forum, the interior courts and peristyles of which were richly decorated with marbles, being the earliest Roman buildings in which marble was used. Augustus, however, extended its employment in the erection of magnificent temples, theatres, and other buildings; and encouraged the citizens to follow his example. It is true that, as a rule, marble was employed only as a facing; but it led to the substitution of solid concrete walls for those in unburnt brick which prevailed in Rome up to his era.

The author to whom we are the most indebted for our knowledge of the architecture of Rome, prior to the Augustan

era, is Marcus Vitruvius Pollio, an architect and engineer who wrote a work entitled *de Architectura*. In this work, among other subjects, he describes in detail the different materials employed in building, and suggests the rules of proportion which should guide architects in their employment of the orders. His work would seem to have been written in the latter part of his career, and it was dedicated to his patron, Augustus, about 25 B.C. As no mention of any of the important monuments erected by Augustus is made, we may assume that he died shortly after his patron's accession. The information he gives about Greek temples was obtained from various Greek authors, with whose writings he seems to have been acquainted, such as those of Ictinus, the architect of the Parthenon; Hermogenes, the architect of the temples of Diana at Magnesia and Bacchus at Teos, and others. Vitruvius never visited Greece, and he had apparently not heard of the temples in Magna Graecia or Sicily, or he would scarcely have put forward the assertion of "some ancient architects that sacred buildings ought not to be constructed of the Doric order" (IV. 3). The accounts of various materials which he gives, however, in Books II. and VII. are of great value.

The three descriptions of walls given by Vitruvius are:

1. Walls of unburnt brick (lateres).
2. Stone walls in coursed masonry.
3. Concrete walls, with or without facing.

1. *Walls of Unburnt Brick.*

From the lengthy description given of unburnt brick, the precautions taken to preserve the walls, the rules relating to the thickness of walls, the manufacture of the bricks, the length of time they should be kept before being used, and the numerous references made to unburnt brick structures in Greece which the discoveries in the last few years have confirmed, we may assume that it constituted a very important element in the construction of the walls of private residences, and was in fact the material referred to in the boast of Augustus, viz., that he found Rome of brick and left it in marble. Kiln-burnt bricks or tiles were employed in Vitruvius's time for the protection of the upper part of these crude-built walls, and for the covering of roofs. The

bricks used were two feet square, virtually the same size, therefore, as those which were universally employed in the time of Augustus. Vitruvius (V. 10) describes also a method of building ceilings over the sudatorium, or hot room in the public baths, in which similar burnt bricks rest on iron rods or arcs two feet apart, the under-side first plastered with pounded tiles and lime, and then finished with stucco or fine plastering. "If this vaulting (concamerationes) be made double," he says, it will be better, because "the moisture of the steam cannot then affect the timber (*i.e.*, of the roof or floor), but will be condensed between the two vaults." The only other references to vaults concern those covering granaries and store rooms, probably of small span. To the further development of the vault reference will be made later on.

2. *Stone Walls.*

Vitruvius's references to stone walls in coursed masonry are not very complete. He speaks with admiration of Greek masonry because it was built of hard stones. The Romans, of course, employed naturally the materials they had at hand, and although they were obliged to build their walls with soft tufa stone, these walls, some of which date from the earliest period, still exist up to our day. The stones employed vary from three to four feet in length, twenty-two to twenty-four inches in height, and twenty-one inches thick. As tufa is a bad weather stone, the walls were protected externally by a coat of stucco. In the Tabularium tufa is used internally only, the facing being of peperino stone quarried in the Alban hills, which has the further advantage of being unaffected by fire. Travertine stone, quarried near Tivoli, is a compact, hard limestone, and was used by the Romans when great strength or resistance to crushing was required, as in the voussoirs of arches. The flat arches of the doorways, referred to when describing the Tabularium and the Forum Julium, are of travertine. It makes an excellent lime when burnt, and to its employment in Roman mortar and concrete the latter partly owes its great durability. There is, however, another material mentioned by Vitruvius (II. 4), pozzolana, which he describes as being found about Baiae and in the neighbourhood of Vesuvius (but which, according to Dr. Middleton, exists in great

quantities under and round the city of Rome), and it is to this material more than any other that the same author attributes the immense strength and durability of the Roman concrete, which he says contributed to make Rome "the Eternal City." Curiously enough, the only reference in Vitruvius to marble as a building material is in Bk. VII., where he speaks of its value when converted into lime for plastering. The Temple of Julius, however, built 42—29 B.C., and referred to by Vitruvius (III. 2) as an example of pycnostyle (*i.e.*, with narrow intercolumniations), was built in white marble on a podium of tufa, peperino and travertine. The Temple of Venus in the Forum of Caesar, built 48—46 B.C., was of similar materials.

3. *Concrete Walls with or without Facing.*

Concrete was used in foundations and as a backing to walls from the earliest times, and from the second century B.C. it was frequently used for the walls of Roman buildings. A clear description of the method employed in building concrete walls is given in Middleton's *Rome*, vol. ii. 47—62. They were cast in troughs formed by vertical posts three feet apart, with wooden boards nailed on outside. Generally such walls were faced with small stones, the facing being of two kinds: the most ancient (opus incertum) consisting of small blocks of tufa stone three or four inches across, the outer face worked smooth, the inner roughly worked. In the second kind (opus reticulatum) the blocks were square on the face and built in lozenge-wise, with close joints running in diagonal lines. This was the method employed in the time of Augustus, but supplemented by the introduction of burnt brick quoins, bonding courses at intervals through the wall, and brick arches. Early in the first century of our era, the tufa of the opus reticulatum was replaced by triangular bricks in regular courses, the apex of the triangle being bedded in the wall.

In the building of these walls there would seem to have been an alternation of two processes. First, a semi-fluid mixture of lime, pozzolana and small stones was poured in, then a layer of larger stones, three to six inches across, which was laid by hand. Then followed the semi-fluid mixture, and so on alternately. The top of the wall was levelled to receive the bonding course of tiles through the wall as above mentioned.

A similar method of construction would seem to have been employed from the time of Augustus in building vaults, but in those of great dimensions, such as the intersecting barrel vaults covering the great halls, ribs and ties of brick were employed first, to economise the centering.* Ordinary vaults over cellars or granaries of comparatively small span, it may be assumed, were invariably built in concrete, as it was a material already known to the Romans in the fifth century B.C., when it was used as a backing in the walls of Servius Tullius. Vitruvius's meagre references to vaults suggest that they were recognised traditional methods of covering over cellars, and therefore requiring no detailed account. His description of the ceilings over hot baths (already referred to) is given in Bk. V. chap. 10, and reads "iron rods or arcs, placed two feet apart and suspended by iron hooks from an upper framing of timber, carry tiles side by side, the upper parts of the joints being stopped with clay and hair, and the under-side first plastered with pounded tiles and lime and then finished with stucco and lime plastering"—and again, the account he gives of arched ceilings † may be taken as fair evidence that prior to the time of Augustus no attempt had been made to cover over spaces exceeding eight or ten feet with regular vaults. The introduction of the intersecting barrel vault, and the covering over of wide spaces with barrel or segmental vaults, such as are shown in Palladio's plan of the Baths of Agrippa, has raised a question as to the source from which the Roman architects derived their knowledge of this method of construction, and Professor Baldwin Brown, in a valuable paper read before the R.I.B.A. in 1889, on the "Origin of Roman Imperial Architecture," pointed out that the various records and descriptions given of the buildings erected in Alexandria in Egypt when that town was laid out by Dinocrates, the architect to Alexander the Great, show that the vault was extensively used even in buildings of considerable

* The various methods employed are clearly set forth in M. Choisy's *l'Art de bâtir chez les Romains*, and in Viollet-le-Duc's *Dictionnaire Raisonné*, under the article "Voûte."

† Vide Book VII. 3, in which he describes how they should be executed with parallel ribs of cypress, cut to the shape of the curve, and fixed to the flooring or roof with iron nails; then Greek reeds, previously bruised, tied to them with cords made of the Spanish broom; on the upper side of the arch a composition of lime and sand is to be laid, so that if any water fall from the floor above or from the roof it may not penetrate; the arches being prepared and interwoven with the reeds, a coat is to be laid on the under-side: the sand being afterwards introduced and then polished with chalk or marble.

height, the materials employed being burnt brick and mortar, the latter of such excellent quality that up to the end of the eighteenth century portions of walls still existed, although exposed to the continued action of the sea waves. It is only fair to assume, however, that in a country where the construction of brick vaulting dates back to between 3000 and 4000 B.C. the building of the same and the nature of the centering employed would follow on the old traditional lines; and, if so, the Roman Imperial architect owed but little to Egypt, as the ancient Egyptian and the Roman methods differed widely. In the erection of vaults the Egyptians dispensed altogether with centering, and the tradition exists to the present day, whereas (as will be seen later on) the Roman architect always employed centres, on which the skeleton of the vault was first built with arches in burnt brick. The filling-in of the same and of the haunches was carried out by the two same processes already described when speaking of the walls, *i.e.*, the alternation of layers of a semi-fluid mixture of lime and pozzolana and of small stones; and as these layers (according to M. Choisy and Dr. Middleton) are always horizontal, and would seem to have been employed in Rome at an early date, the extension of the same system from the wall to the vault would follow naturally, without necessarily any foreign influence, except that of the knowledge of a common practice in Alexandria of vaulting over large spaces. The same might be said with respect to the immense vaulted water reservoirs of Carthage,* with which the Romans would be well acquainted.

There is, however, one invention of great importance which may have an oriental origin, viz., the intersecting barrel vault, to which attention has been already drawn. M. Choisy instances a tomb in Pergamum, belonging to the beginning of the second century B.C., which is covered by two intersecting barrel vaults regularly constructed with stone voussoirs. It is a problem the solution of which is more likely to have taken place in stone construction than in brick or concrete, and its earliest examples would have a comparatively small span; but it must have been carried out by masons long accustomed to the erection of stone vaults, and the perfection of its

* The remains existing of large vaults are probably Roman, but no one has examined their construction to see if any portion is of earlier, *i.e.*, of Carthaginian, date.

execution in this tomb in Pergamum suggests that it was by no means the first attempt.

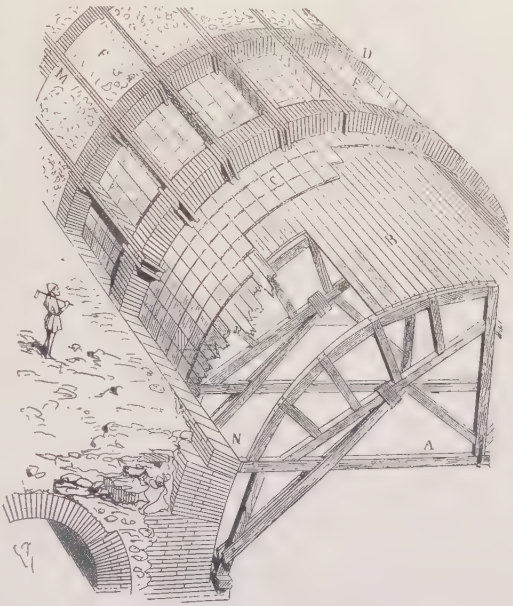
In the early republican vault, *e.g.*, that of the Tabularium, which is of small span, there would be no difficulty in providing centres. When, however, we come to the great hall of the Tepidarium* in the Baths of Agrippa, which in Palladio's plan measures one hundred and seventy feet by seventy feet, with a diagonal groin ninety-eight feet in span, the centering required for the latter and vault would have had to be of great scantling, and would have involved an immense cost, had not the practical mind of the Roman architect conceived the method which is so clearly set forth in M. Choisy's work already quoted. The details vary slightly in the large number of examples quoted and illustrated, but the principle is the same throughout the Empire, so that, although no remains have been found of Agrippa's work, it should be safe to assume that it was built by the same method as that employed in later examples. The Roman vaults always consisted of regular geometrical forms, such as the continuous semicircular barrel vault, the intersecting barrel vault (the groins of which were formed by the intersection of two barrel vaults at right angles to one another), the segmental vault, and the hemispherical dome.†

The researches of M. Choisy have shown that in their inner construction the Roman vaults show the articulated forms of the Gothic vault, with transverse and diagonal ribs, all built in brick with horizontal ties, the web being a subsequent filling-in. This method of construction was adopted not only to economise the centering, but because it could be carried out by large gangs of labourers working under a few skilled overseers and the direction of the architect or engineer. The centering was economised in two ways: firstly, the transverse and diagonal ribs, being built first, formed when completed a permanent centering by themselves, so that the scantlings of the timbers employed in the temporary centering were comparatively slight; and secondly, the latter could be employed again for other portions of the vault. There remained, however,

* See statement, page 252, in which doubt is thrown on the correctness of Palladio's restoration.

† The hemispherical dome as a feature by itself, and not the covering of a semicircular apse of a hall, is first found in the Baths of Titus, 80 A.D.

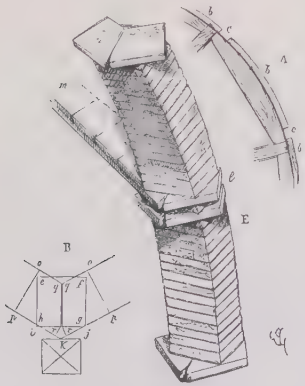
another problem to be worked-out, the solution of which as set forth by M. Choisy constitutes the most valuable part of his discoveries. Taking the central bay of the Baths of Caracalla as an example: the transverse, diagonal (Ill. 135), and intermediate* centerings having been placed and planks laid across from one to the other, the Romans commenced the formation of the vault with a double layer of bricks (measuring 1′ 11″ square and $1\frac{1}{4}$ to 2 inches thick), laid flatwise and breaking joint.



134.—ORDINARY BARREL VAULT CONSTRUCTION, ACCORDING TO VIOLLET-LE-DUC.

A, Light framing; B, Planks laid across; C, Double layer of Roman bricks; D, Rings of bricks on edge; E, Horizontal brick ties.

This formed a shell-vault which relieved the planks from the superincumbent weight. Then over the principal centerings they built rings of similar bricks on edge, connecting these with horizontal brick ties (Ill. 134). The skeleton thus formed seems to have been regarded by the Romans as equivalent to the vertical posts already described, which they employed in building their walls; for the two processes (*i.e.*, the semi-fluid mixture of lime, pozzolana and small stones, and the layers of large stones) were followed in the formation of their filling-in not only of the



135.—THE DIAGONAL RIB.

* About eight to nine feet would seem to have been the average distance between the timber centres, so that three or four intermediate centerings would have been required in the Tepidarium of Caracalla.

haunches, but of the whole vault, and, according to M. Choisy, laid horizontally as in their walls. In other words, the brick ribs, only, constituted the arched construction. *The shell-vault laid on the planks enabled the web to be thus filled in, and probably accounts for its invention.* In the case of large vaults, such as those of the Palaces of the Caesars on the Palatine Hill, and in the Basilica of Constantine, a second superincumbent ring was added above the transverse and diagonal ribs; but the vault was probably already self-supporting, so that the centerings could be removed to another bay. In theory at all events, if not in practice, the resistance to thrust of such immense vaults required buttresses of great projection, and these, as we shall see later on, were provided. Dr. Middleton points out that "it would have been impossible to vault their enormous spans if they had used vaulting of brick or masonry such as were built in mediaeval times. The Roman concrete vault was quite devoid of any lateral thrust, and covered its space with the rigidity of a metal lid." This quality was given to it partly by the nature of its construction, but mainly from the peculiar quality of the pozzolana, which, when mixed with lime, forms a very strong hydraulic cement; and, as Dr. Middleton remarks,* "this pozzolana, more than any other material, contributed to make Rome the proverbially 'eternal city.' Without it, a great domed building like the Pantheon† would have been impossible, as would also the immense vaulted Thermae and a wide-spanned Basilica such as that of Constantine." Dr. Middleton's further remarks on the same page are not borne out in the Thermae, where the buttresses are of great projection. The Romans did not seem to have realised at first how very strong and substantial their concrete was, and in the planning of the Thermae not only took every precaution to supply a counter-thrust, but having, by their intersecting vaults, concentrated this thrust on piers at a distance one from the other, they utilised the spaces between so that the buttress became an integral part of the building. The problem once solved how to vault over large spans with a permanent covering indestructible by fire, not only gave an impetus to the

* *Remains of Ancient Rome*, vol. i., p. 9.

† Since Dr. Middleton's work was published the discoveries made by M. Chedanne have shown that the dome of the Pantheon was constructed with horizontal beds of bricks, so that his remark no longer applies here. To these discoveries reference will be made later on.

development which constitutes the real Imperial Roman style of Architecture, but it also led to a new type of plan, and this spread to all parts of the Empire, with only such variations as were necessitated by the materials at hand. Throughout Syria, for instance, excellent stone abounded everywhere, but no pozzolana; consequently the spaces vaulted over were comparatively smaller than those in Rome, and, in justification of Dr. Middleton's statements, all the vaults have long since fallen-in. The qualities of the Roman mortar are always conspicuous, however, and the ruins of the Temple of Jupiter at Baalbec, amongst others, prove that its tenacity was greater than that of the stone itself. The lines-of-fracture lie in the stone and not in the mortar, which in the cores of their walls and vaults seems to have been employed very much in the same way as in Rome.

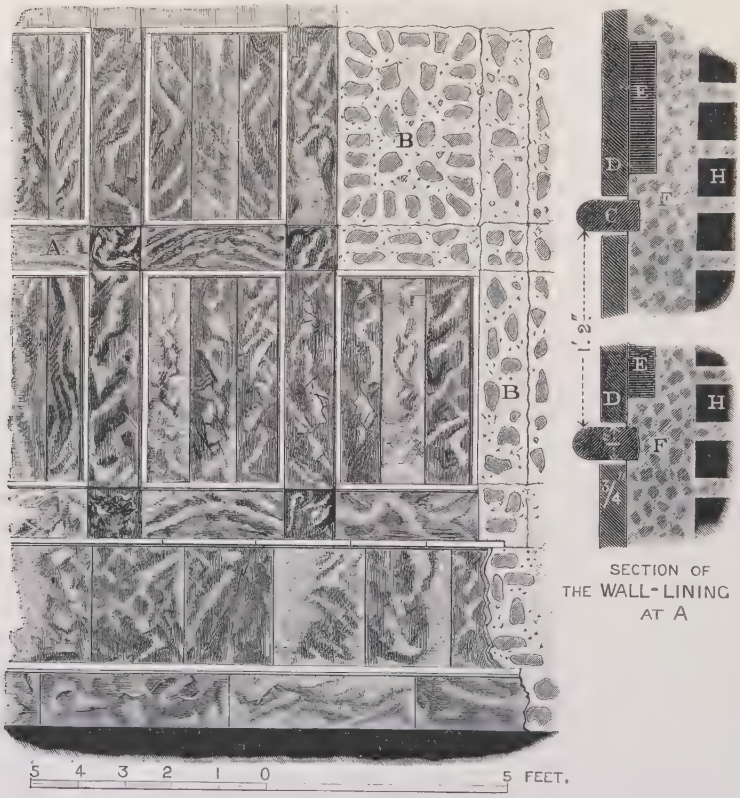
Stucco, Cements, and Marble Facing.

We are indebted to Vitruvius* for the description given of the marble cement (caementum marmoreum, or opus albarium) used by the Romans, the care which had to be taken in its preparation, and the materials of which it should be composed. Its qualities were such that, when set, it had the colour and texture of real marble, and was not much inferior to it in durability. It was owing to the coating of this kind of stucco given to the crude brick walls of the houses built prior to Augustus's time in Rome, that they were able to resist the weather. It was used also to preserve stone, especially when tufa was the material employed. In Sicily and at Paestum, and generally throughout Greece, the whole of the stonework was covered with a fine coat of stucco to fill up the crevices of the aqueous limestones, and to obtain a greater refinement of detail in the profiles of the mouldings, with a view to the ultimate decoration with painting. In Greek buildings the coating was very thin; in Roman work it was usually about an inch thick, and sometimes extended to three inches when it was intended to panel-out the surface, to sink grooves in imitation of stone joints, or to imbed mosaics.

In the first chapter of Book VII. Vitruvius describes also the

* Book VII., 2, 3, and 6.

formation of floors, preparatory to the laying of the marble slabs or tesserae, and their subsequent grouting and polishing. For the decoration of the upper portion of walls internally, and of the vault, glass mosaics were employed, worked sometimes into large and elaborate pictures.* We have already described

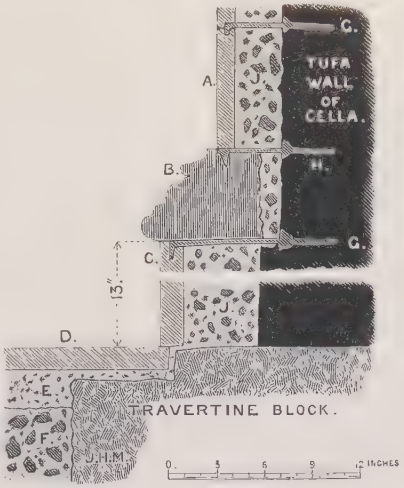


136.—EXAMPLE OF MARBLE PANELLING, ROME.

the facing of burnt brick given to walls built in concrete. This facing had no constructive value, and appears to have been only a decorative finish to the wall surface. It is singular, therefore, that the same process should have been gone through

* The example found at Pompeii, representing the defeat of Darius by Alexander the Great at the battle of Issus, 355 B.C., was probably copied in mosaic from some well-known Greek painting. See Ills. 204 and 205, from M. Paulin's restoration of the Baths of Diocletian.

in the case of walls which, from the first, it was intended to face or line with marble. The illustration (136) taken from Middleton's *Rome* * shows at (H) the brick facing of a concrete wall. This was, however, covered with a concrete bed for the marble (F), so that the brick facing might have been saved. (E) are slabs of marble, slate or tile, bedded in the concrete, against which the marble panels of large size (D) were fixed; and (C) the borders of same. This system would be employed in facing the interior walls of the temples, palaces, and thermae. For the exterior, Ill. 137 shows the marble facing of the cella of the Temple of Concord, in which the slabs are held in position by iron or bronze holdfasts, carried through into the tufa wall, the cornices and plinths generally being in solid blocks.



137.—MARBLE FACING OF THE TEMPLE OF CONCORD AT ROME.

* Illustrations 136 and 137 are reproduced by the kind permission of Messrs. A. and C. Black, the publishers of Dr. Middleton's work.

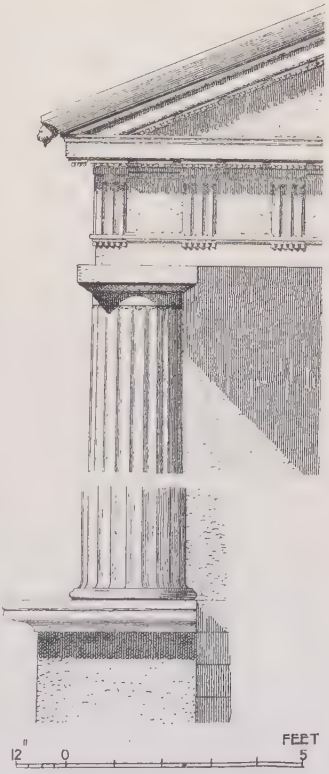
138.—PORTION OF THE FRIEZE OF THE TEMPLE OF THE SUN ON THE QUIRINAL AT ROME.

CHAPTER X.

THE ORDERS.

Our description of the Greek orders was given in chronological sequence, as we had first to search for the earliest forms known, then to trace their development till they reached their perfected types, and lastly to follow their decadence during the Alexandrian period. Even in this last stage they preserved their rational basis, and formed still, not only the decorative, but the leading constructive features of the monuments of which they were part. When, however, we come to deal with the Roman orders, our position is changed. With the exception of the Corinthian order, no further development was possible, and the employment of the modified forms of the Doric and Ionic orders by the Romans seems to have been dictated by the extreme simplicity of the former and of variety in the latter. As a detached column there are few temples in Rome of the Doric order, but it was employed in Pompeii, in Asia Minor, and in various cities in Syria and North Africa. There are not many examples either of the Ionic order still existing, but to judge by the great variety and number of Ionic capitals used up in the early Christian basilicas of Rome it must at one time have been largely employed. In our description of Etruscan architecture we have referred to three or four types of capitals, but in no case do we find that which constitutes an Order, viz., a combination of column and entablature designed in relation one to the other. The Etruscan support was either square or circular,

In the former case it probably carried a stone beam or architrave, but except in tombs cut in the rock no examples exist. In the Tuscan order* described by Vitruvius the proportions of the column, with its base, shaft, and capital, are given. The superstructure, however, being in timber only, protected by terra-cotta slabs, never acquired any definite proportions. Already in the third century B.C. some of the elements of the Greek Doric order, viz., the triglyphs and metopes, had been imported, and the only important influence which the Etruscan column seems to have had was the addition of a base to the Doric column.



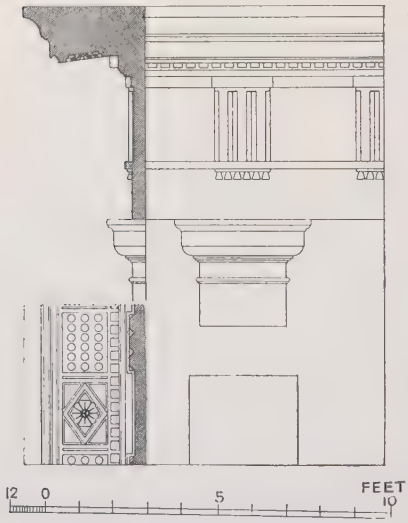
139.—DORIC CAPITAL AND BASE OF THE TEMPLE OF HERCULES AT CORA. (Height of columns, 19′ 8″; diameter, 2′ 4½″.)

The Roman Doric Order.

The principal examples of the Doric order in Rome are those which are found in the Tabularium, the Theatre of Marcellus, and the Colosseum. In all these cases, however, they were only engaged columns, used in a decorative sense; and, so employed, the difficulty raised by Vitruvius as to the triglyph at the angles never arose. In the only Roman Doric temple known, at Cora (Ill. 139), the triglyph is placed at the corner and not in the axis of the angle column, as suggested by Vitruvius, and it is difficult to understand why he should have objected, in a hexastyle temple, to the slight contraction of the intercolumniation of the two angle columns, especially as he recommends a wider intercolumniation of the two central columns to give a freer passage to those who approach the

* The only examples now existing of the Tuscan order are the three-quarter detached columns on the lower storey of the Colosseum, but their proportions do not agree with those laid down by Vitruvius, which are given for the isolated columns of a portico; he assigns to the order 7 diameters with a diminution at the top of one fourth of the lower diameter. Their capitals should be half a

statues of the gods. In both the tombs at Norchia the triglyph is placed at the extreme angle, and the same arrangement is found in the tomb of Scipio, and in many of the sarcophagi, so that it is possible Vitruvius's recommendation was never followed. The Doric order of the Theatre of Marcellus (Ill. 140) (the favourite example selected for publication) is always represented as an isolated column taken from the angle of a building or temple, instead of being a semi-detached shaft and part of the decorative treatment of a circular building. The exact date of the Temple of Hercules at Cora is not known, but the almost Greek purity of its design suggests an early period, and it may have been part of Sulla's work in that town (B.C. 80), especially as the echinus moulding of the capital is similar to that of the semi-detached columns of the Tabularium, known to have been built about the same time. The next example in date is that of the Theatre of Marcellus, where the echinus still preserves its conic section. In the Colosseum even this refinement is lost, and henceforth it becomes always a quarter round, with a few exceptions where an ogee moulding replaces the echinus. The bases of the Temple of Hercules at Cora are probably derived from Tuscan sources. In the Theatre of Marcellus some trace of a base is said to have been discovered of late, probably of the same nature as that of the Theatre of Pompey, where a circular die of slight projection exists under the shaft. In the Colosseum and in later examples a base is generally found, the principal exceptions being in Pompeii, which are probably of much earlier date.

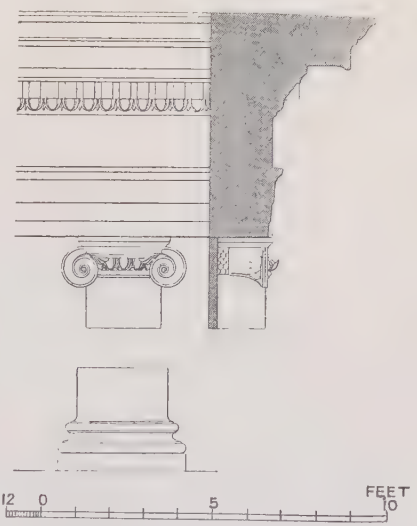


140.—DORIC ORDER OF THE THEATRE OF MARCELLUS AT ROME.

diameter high, one-third of which is given to the abacus, one-third to the echinus, and one-third to the hypotrachelium with its apophyge. The base was also half a diameter equally divided between the die or plinth and the torus with fillet.

The Roman Ionic Order.

If one may judge by the great variety of Ionic capitals which were utilised in the naves of the Christian basilicas, the Order was in considerable favour in Rome. As, however, the capital with canted volute is rarely found, it is possible that those so used came from the porticoes which enclosed the Imperial Forums, and at one time, according to Pliny, extended over the Campus Martius. The capital of the Order must have perplexed the Roman architect, especially as, in consequence of the increased size of the pronaos, the awkward arrangement of the inner angle would have been more conspicuous than in the narrow Greek portico. The ultimate solution of the problem is best seen in the Pompeian capital (Ill. 244), where the volutes are all canted on the angles, the projection of the volutes being much less than that found in Greek examples. The carving of the volutes here is so much more refined than in any other Roman Ionic capitals, that we may assume it was the invention of a Greek artist. The principal examples in Rome of the Roman Ionic capital are those of the Temple of Fortuna-Virilis, the Theatre of Marcellus (Ill. 141), and of the Temple of Saturn, the latter of a very debased type. In Syria the Order was occasionally employed, possibly because it was difficult to find artists to carve the Corinthian capital. At Gerasa a portion of one of the colonnaded streets and the great circular piazza have columns and capitals of the Ionic Order.



141.—IONIC ORDER OF THE THEATRE OF MARCELLUS AT ROME.

The Corinthian Order.*

If the Doric and Ionic Orders found but little favour with the Roman architects in the designs for their temples, it was far

* The origin of the title 'Corinthian' given to the Order has never yet been determined. The term is used by three classic authors—by Vitruvius, Pliny, and Pausanias. The latter (viii. 45) refers to the Corinthian columns of the Temple of

otherwise with the Corinthian. Not only did the richness of its decoration appeal much more to the Roman instinct, but it had the special advantage of presenting the same design in all four faces, and could be employed equally well for the peristyle of a rectangular or circular building, or in the decoration of the hemicycles which played so important a factor in the setting out of the plan. The Greek Corinthian capital, though varied in design, and in many cases of great beauty, was never completely developed, and it remained to the Roman to systematise the double range of leaves which surround the lower part of the bell, and to give a greater sense of support to the abacus by the accentuation of the spiral tendrils at the four angles. The type of capital was probably already known in Rome, and, in fact, there is a

142.—CORINTHIAN CAPITAL OF TEMPLE OF CASTOR AT ROME.

Athena Alea at Tegea, and his casual reference suggests that the term was well recognised and required no description. The fancy description given by Vitruvius (iv. 1) of the capital is based naturally on the examples he had seen in Rome, which were probably copied from the capitals of the Temple of Jupiter Olympius at Athens, brought to Rome by Sulla, and they have no resemblance to the earliest examples of the capital in Greece. It informs us also that it was invented by Callimachus of Corinth. Now Callimachus of Corinth was the craftsman who is said by Pausanias to have *made a golden lamp for the goddess* Minerva Polias in the Erechtheum, and probably also *the bronze palm tree reaching to the roof* which drew off the smoke. As the earliest Greek Corinthian capitals all suggest a metallic origin, and as Callimachus is known to have worked also in marble, it is conjectured that he reproduced in marble a type of capital which was copied from one in bronze. Pausanias (ii. 3) refers also to Corinthian bronze, which he says "got its colour by being plunged red-hot into this water," referring to some particular spring. Corinthian bronze, for various reasons, was celebrated in ancient times, and Pliny (Hist. Nat. xxxiv. 13), speaking of the Porticus built by Cneius Octavius in 168 B.C., says it was *called Corinthian from its brazen Corinthian capitals*. The title, therefore, may have been given because it was invented by Callimachus of Corinth, or on account of the material in which the first prototype was wrought. Pliny's statement, however, goes still further, as it suggests that the leaves and tendrils of the Corinthian capital were occasionally wrought in bronze, instead of being carved in stone or marble.

reference in Pliny to the Porticus built by Cneius Octavius in 168 B.C., referred to in note (p. 175). The model, however, on which the Roman Corinthian capital, as developed under the Empire, was based was probably that of the Temple of Jupiter Olympius at Athens (Ill. 112, p. 127), the columns of which Sulla exported, to enrich the Temple of Jupiter Capitolinus at Rome.* Penrose was of opinion that the monolith columns taken away at that time were probably those destined for the cella of the Greek temple, and if utilised in Rome were probably placed inside the cella of the Roman temple, being much too small for the portico.

143.—CORINTHIAN CAPITAL OF THE TEMPLE OF CASTOR AND POLLUX AT CORA.

In the development of the capital the Romans not only systematised the double range of leaves and strengthened the angle spirals, but they also masked the bell more effectually than we find in the Greek examples. In the carving of the acanthus leaf, based on the plant of the Acanthus spinosus, they made the section flat in the place of the V section which characterises all Greek work. In Syria, where the Greek artists would seem to have been invariably employed, the V section was still retained, and even in the works carried out by the Roman Emperors in Athens and elsewhere in Greece we find the same distinction. Even in Rome itself there are one or two examples in which this characteristic may be noted, as in the circular Temple of Mater Matuta in the Forum Boarium. The assumption, therefore, which has been made as to the employment of Greek artists in Rome is not borne out by the best-known examples of capitals, such as those of Agrippa's Portico, re-erected in front of the Pantheon

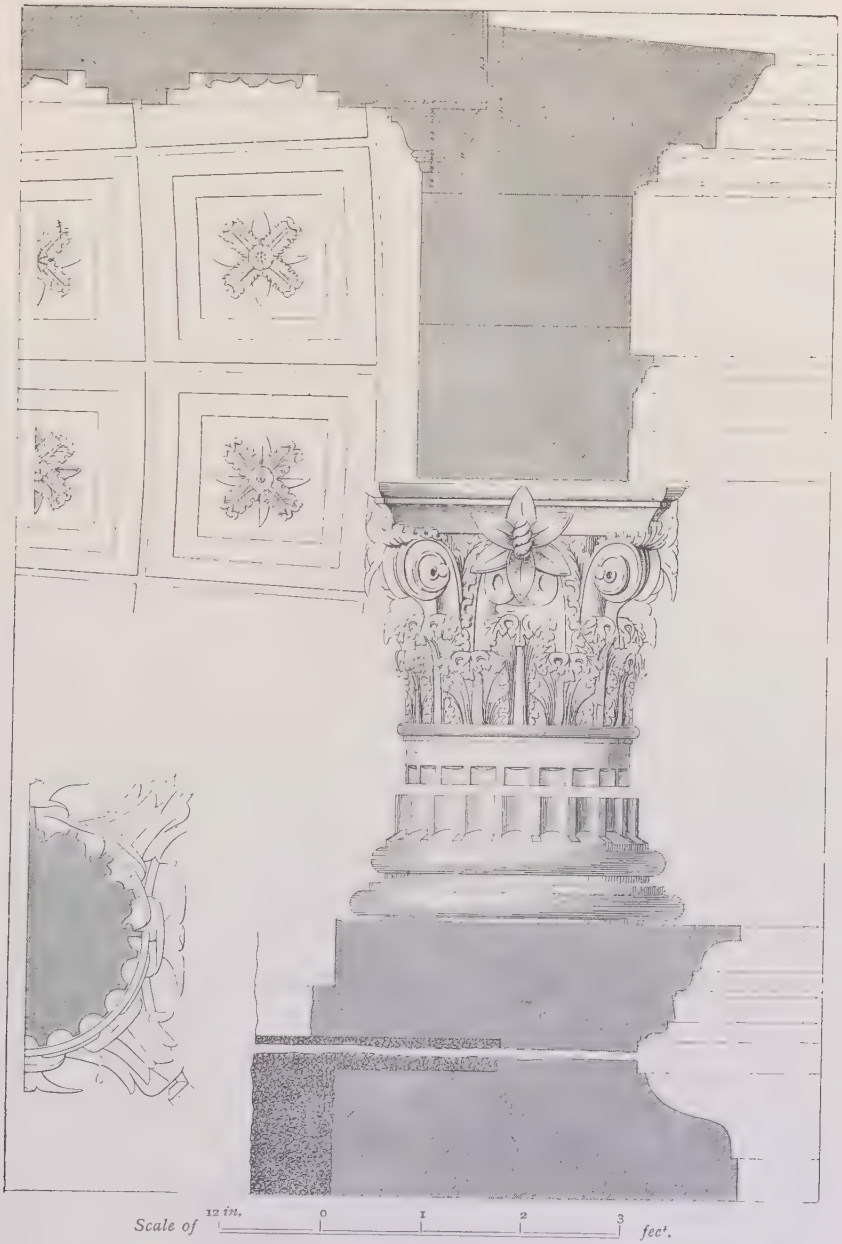
* See note, page 176.

of Hadrian, or of the Temple of Mars Ultor. There is, however, a peculiar refinement in the leaves of the capital of the Temple of Castor at Rome (Ill. 142), which seems to follow the olive leaf rather than the acanthus, and suggests the Greek chisel. A second type of capital, found at Pompeii and in the Temple of Vesta at Tivoli (Ill. 145), is decorated with foliage which is based on another variety of the plant—the Acanthus mollis. A third type is found in the capitals of the Temple of Castor and Pollux at Cora (Ill. 143), which might be termed Graeco-Roman; it is also found in Olympia, where many extensive works were carried out under the patronage of the Roman Emperors.

144.—CORINTHIAN CAPITAL OF THE INTERIOR OF THE TEMPLE OF CONCORD AT ROME.

Later on, under the Empire, the lobes of the Acanthus spinosus disappear, and the Romans return to the type of foliage carved in the capitals of the Temple of Vesta at Tivoli, without, however, its vigorous character. The leaves of the Composite capital of the Baths of Diocletian show the ultimate phase of Roman work, not only in Rome, but throughout Italy and the South of France.

The most beautiful example of the Roman Corinthian capital is that which is found in the Temple of Castor already referred to, and in this capital a new element is found which



145. CAPITAL AND BASE OF THE TEMPLE OF VESTA AT TIVOLI.

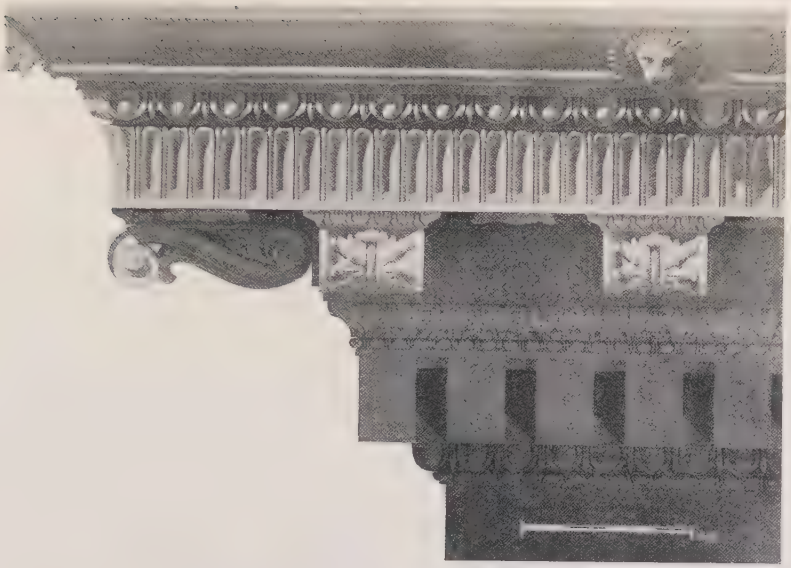
does not exist in any other example. Between the angle and centre volutes rises a tendril from which foliage is carried along the cavetto moulding of the abacus.

The desire for novelty led the Romans to many vagaries, among which the capitals of the decorative order inside the Temple of Concord (Ill. 144), where the volutes consist of rams' heads, and in the Temple of Mars Ultor of winged horses. In the Church of S. Lorenzo at Rome are capitals with figures of Victory at the angles, and trophies of armour on each face, and in the Composite capitals of the Thermae of Caracalla a figure of Hercules forms the central feature on each face.

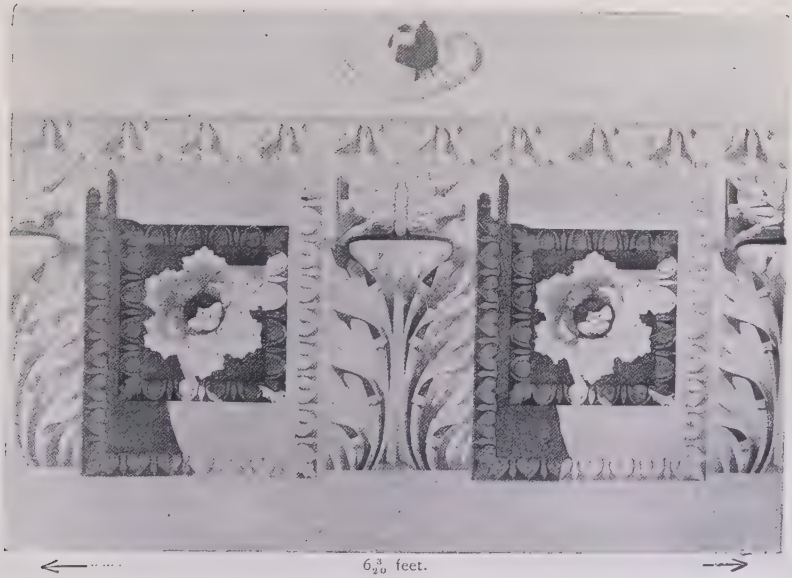
146.—EARLY CORINTHIAN CAPITAL NOW IN THE CHURCH OF S. NICCOLO IN CARCERE.

The position of the egg and tongue and the close resemblance of the foliage of a capital now in the Church of S. Niccolo in Carcere (Ill. 146) to those which are found in the Arch of Hadrian at Athens suggest its execution by one of the Greek artists whom Hadrian brought to Rome.

The entablature of the Greek Corinthian order was not evolved from earlier constructional forms in timber in the same way as those of the Doric and Ionic orders, and in the earliest example, viz., that of the monument of Lysicrates (Ills. 107, 108, pp. 123, 125), the sub-divisions of the architrave, the figure decoration of the frieze, and the mouldings of the cornice, would seem to have been borrowed from Asiatic types of the Ionic order, the dentils, however, being much reduced in projection. The Romans followed the same course, except that in the earliest example,



147.—CORNICE OF THE TEMPLE OF CASTOR AT ROME.



148.—SOFFIT OF CORNICE OF THE TEMPLE OF CASTOR AT ROME.

viz., Agrippa's Portico of the Pantheon, the dentils are left uncarved. The Romans, however, introduced a new feature (*i.e.* the modillion), a corbel giving support to the projecting corona. The spaces between the corbels were, as a rule, made square, the soffit being sunk as a coffer and decorated with a centre flower. The over-elaboration in the decoration of the entablature of the Temple of Castor (Ills. 147—149) is probably the result of carving the ornaments which in the Greek entablature were only painted; but the relative proportions of the mouldings, the greater importance given to the dentil course, and the depth of the corona, place this temple far above any other examples, with the exception, perhaps, of the Pantheon and the Temples of Antoninus and Faustina, in which latter example there are no modillions. Already in the Order of the Forum of Nerva the decadence of the style would seem to have set in, owing to the employment of inferior artists, and this may be observed in the cornices of the Composite Order of the Arches of Titus and of Septimius Severus, in the Thermae of Diocletian, and of the Corinthian Order of the Arch of Constantine. The remains of the Temple of the Sun on the Quirinal Hill* are of so refined a character, not only in the

149.—ARCHITRAVE OF THE TEMPLE OF CASTOR AT ROME.

150.—IONIC CAPITAL FOUND IN THE FORUM OF TRAJAN.

* Du Perac calls it the Frontispiece of Nero, and gives a drawing of the rear wall of the temple as it existed in 1674 (see frieze, Ill. 138, p. 172).

proportions of the Order, but in the profile and decoration of the mouldings of the entablature, that it seems at first difficult to recognise in it the temple built by Aurelian * on his return from Palmyra in 273 A.D. The modillions are set back behind the corona, take the same position, and are of the same proportions as the widely-projecting dentil mouldings of the Ionic temples of Asia Minor.

151.—COMPOSITE CAPITAL FOUND IN THE FORUM OF TRAJAN.

The Composite Order.

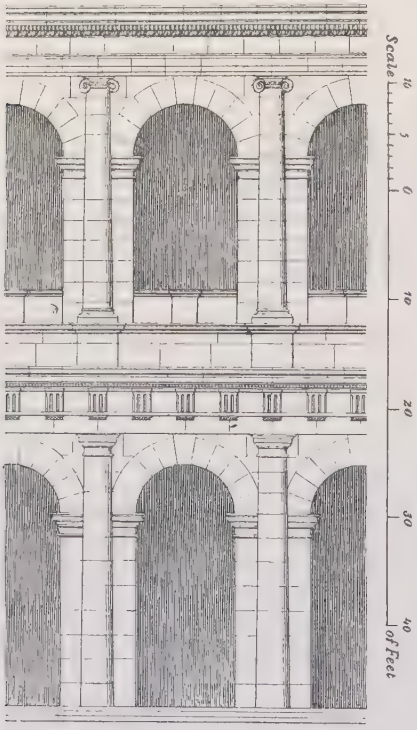
The earliest example of this Order in Rome is found in the Arch of Titus, but, as we have already stated, earlier examples exist in Asia Minor. It is usually assumed that the Romans, conscious of the weakness of the tendril volutes of the Corinthian order, replaced them by the volutes of the Ionic order. This, however, is not borne out by the facts. In one of the earliest examples of the Greek Ionic Order, viz., that of the Temple of Apollo at Naucratis (Ill. 45, p. 57), the necking is already decorated with the anthemion. Its more perfect evolution is found in the capitals of the Erechtheum, the Roman version of which may be seen in an Ionic capital found in the Forum of Trajan (Ill. 150). The selection of the acanthus foliage in preference to the anthemion † is found in the capitals of the pronaos of the

152.—COMPOSITE CAPITAL OF THE ARCH OF TITUS.

* The columns of this temple were fifty-eight feet high, and the entablature nearly sixteen feet. The fragment of the entablature now in the Colonna gardens weighs about ninety tons, so that Aurelian attempted to rival the structures of Palmyra in the size of the blocks of marble he employed.

† Prof. Meurer is of opinion that the anthemion is derived from the flower of the

Temple of Jupiter at Aizani (Ill. 104, p. 119), where a single row of leaves only is carved, and marks the next development; and the adoption of the two rows of leaves in the capitals of the proscenium of the theatres of Asia Minor suggests that the Composite capital originated in the desire to give a richer effect to the capitals of the Ionic Order. Of a similar type to Ill. 146 is the capital, Ill. 151, which may have been carved by the same artist. In the Composite capitals of the Arches of Titus, Septimius Severus and of the Thermae of Diocletian, the upper fillet of the volute is raised into the cavetto moulding of the abacus, and is carried through horizontally;* a similar treatment exists in every Roman Composite capital, of which there are many examples still existing in the museums and churches of Rome.



153.—A BAY OF THE THEATRE OF MARCELLUS AT ROME.

The Superposed Orders.

The combination of the arcade as a constructive feature with the orders employed as a wall decoration, and the superposition of the orders, may be taken to constitute that which virtually became a new Roman order, inasmuch as in the earlier examples there seems to have been a definite proportion both in the intercolumniation of the shafts and the relative proportion

acanthus and its sheathing leaves, while the leaves on the lower part of the stem form the prototype of those employed in the Corinthian capital.

* In many of the published drawings the volutes are represented as dying into the echinus, and in the interpretation of the capital by the Italian masters and as executed at the present day the origin and meaning of the upper fillet as the junction of the volutes is entirely lost, as each volute is made a separate feature tucked in on the top of the echinus.

of the orders superposed. Thus in the Tabularium the distance from centre to centre of column is five diameters, and five and a quarter in the Theatre of Marcellus and in that of Pompey. In the Basilica Julia it was five and a half. In the lower or Doric Order of the Theatre of Marcellus (Ill. 153) the columns are eight diameters high, and taper by one-seventh of the lower diameter at the top, and this becomes the lower diameter of the Ionic column above, of which the height is nine diameters. The upper storey has gone, so that it is not possible to trace the principle further. In the Colosseum, where there are three superposed orders, the proportions are defective; and the mouldings which, in the Theatre of Marcellus and the Tabularium, still preserved some Greek character, in the Colosseum become portions of circles, and of a very commonplace type. This suggests that the architect confined his attention to the general design of the plan, and left the details to his subordinates. The distance from centre to centre of the columns in the Colosseum is seven and a half diameters, the Doric column is *nine and one-third diameters high*, and the Ionic and Corinthian *eight and three-quarters only*, all having the same diameter at the base.

154.—THE TEMPLE OF MINERVA AT ASSISI.

In the interpretation of the Orders by the Italian Revivalists, they would seem to have assumed that no order, in conjunction with an arcade, was complete without a pedestal. There is

no example of this feature in the Doric Order in Rome, and that of the Ionic Order in the Theatre of Marcellus and in the Colosseum is part of a plinth which was required to give height for the vaulting of the lower storey; but they were not detached features as shown in Vignola and Palladio. There is, however, one well-known example in the Temple of Minerva at Assisi (Ill. 154) where, to give additional width to the road passing in front, the steps are set back between pedestals carrying the columns of the main front. In North Africa, the columns decorating the front of the Praetorium at Lambessa are raised on pedestals, and in Syria are other examples, as in the Praetorium at Mousmieh (now destroyed), the so-called temple at Sunamein south of Damascus (Ill. 155), the temple of Kanawat in the Hauran, the temple of Neptune at Palmyra and the Propylaea at Baalbec (Ill. 162).

155.—TEMPLE OF THE GODDESS FORTUNA AT SUNAMEIN (222—235 A.D.).

In the Roman Triumphal Arches pedestals were required on account of the height of the central archway, but they vary so much in the relation of their height to those of the columns they carry, that no rules could be applied to them as part of the Order. Thus in the Arches of Titus, Septimius Severus and Constantine, the relation is as 2 : 5; at Beneventum 2 : 4; at Tebessa 2 : $4\frac{3}{4}$; at Orange 2 : 8; and at Ancona 2 : $9\frac{3}{4}$.

156.—THE ROMAN FORUMS.

CHAPTER XI.

THE FORUMS OF ROME.

THE COLONNADED STREETS AND ENCLOSURES OF TEMPLES IN THE EAST.

THE forum in Roman architecture corresponded to the Greek agora already described in Chapter VII., and of which there were two types—the Agora Civilis or public forum, and the Agora Venalis or market place. Under the Republic the Forum Romanum seems to have served both purposes, as some of the chief temples and important public buildings occupied sites round it, and up to the time of Julius Caesar there were shops on both sides. Besides this, like the Agora at Elis, it was used as a Hippodrome, and served for combats and various other displays. Under the Empire these latter were relegated to the amphitheatre, the circus, and the theatre; markets were provided elsewhere, the Forum was cleared of its shops, and became the great centre for the law courts, exchange, and other buildings of public importance.

In course of time the Forum Romanum no longer sufficed for the increased demands made upon its space, and a number of Forums were subsequently built by succeeding Emperors, *e.g.*, those of Julius Caesar, Augustus, Vespasian, Nerva, and Trajan. All these additional Forums were planned symmetrically; and from their size and magnificence, both in design and material, they give a far more complete idea of the Roman

architectural style than can be obtained by the study of the temples, basilicas, and other monuments apart from their surroundings.

In Rome no importance would seem to have been attached to the orientation of the temples, which were regarded more from the monumental than from the religious point of view; they occupied the most important positions facing the Forum, only in a few instances being isolated in a court surrounded by porticoes, in imitation of those in Greece. As a result of its gradual growth, the Forum Romanum (Ill. 157) was not symmetrically planned. The temples on either side or at the ends, varying as they did in plan, in dimensions and orientation, and being interspersed with other monuments, presented a much more magnificent effect than when enclosed in a court, and so resembled more the accidental and picturesque arrangement of the Greek shrines. As already pointed out in the chapters on Greek architecture, the Greeks not only selected beautiful sites, but utilised their varying levels, and planned their buildings in harmony therewith, thus wedding art to nature. This was not always the case with the Romans, who, possessed of greater means, invariably levelled their sites, and then set out plans of symmetrical design in which a central axis formed the chief characteristic (see Ill. 157). When founding new cities, or in cases where the ground was occupied by unimportant buildings only, which could be cleared away, no great difficulties presented themselves; but in Rome, where the ground in the vicinity of the Forum Romanum had already in the first years of the Empire acquired an immense value, the sites were frequently curtailed in size, and sometimes abutted on other buildings or streets running at various angles, and as it was considered to be of importance that the new Forums should be contiguous to the Forum Romanum, the only site available was that under the cliffs of the Quirinal Hill; consequently, at all events on the north-east side, they had to be enclosed with lofty walls in order to mask the cliffs against which they butted and the buildings surmounting them. The height of the walls round the Forum of Augustus was over one hundred feet, and such an enclosure would have had a dreary effect if the Romans had not known how to give interest to these walls by their decoration, and by the variety of their outline and form. This will be better followed on reference to the plan

Ill. 157.

Plan of the
Forums at
Rome.

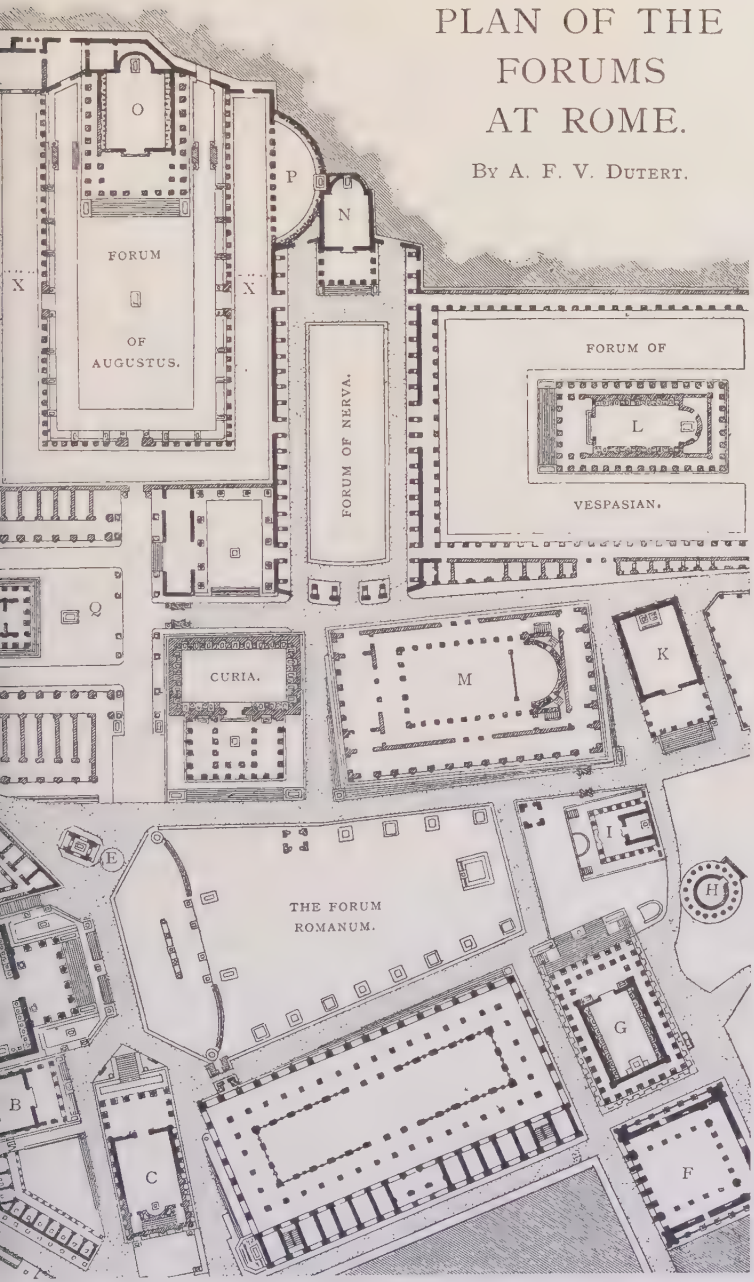
REFERENCES.

A. Tabularium.
B. Temple of Vespasian.
C. Temple of Saturn.
D. Temple of Concord.
E. Arch of Janus.
F. Temple of Augustus.
G. Temple of Castor.
H Temple of Vesta.
I. Temple of Julius.
K. Temple of Antoninus & Faustina.
L. Temple of Peace.
M. Basilica of Paulus Emilius.
N. Temple of Minerva.
O. Temple of Mars Ultor.
P. Hemicycles.
Q. Forum of Julius Cæsar.
R. Temple of Venus.
S. Existing Walls of Offices.
T. Arch of Trajan.
U. Law Courts.
V. Trajan's Column.
W. Libraries.
X. End of Porticus according to Canina.

SCALE 100 50 0 100 200 300 40

PLAN OF THE FORUMS AT ROME.

By A. F. V. Dutert.



Ill. 157.

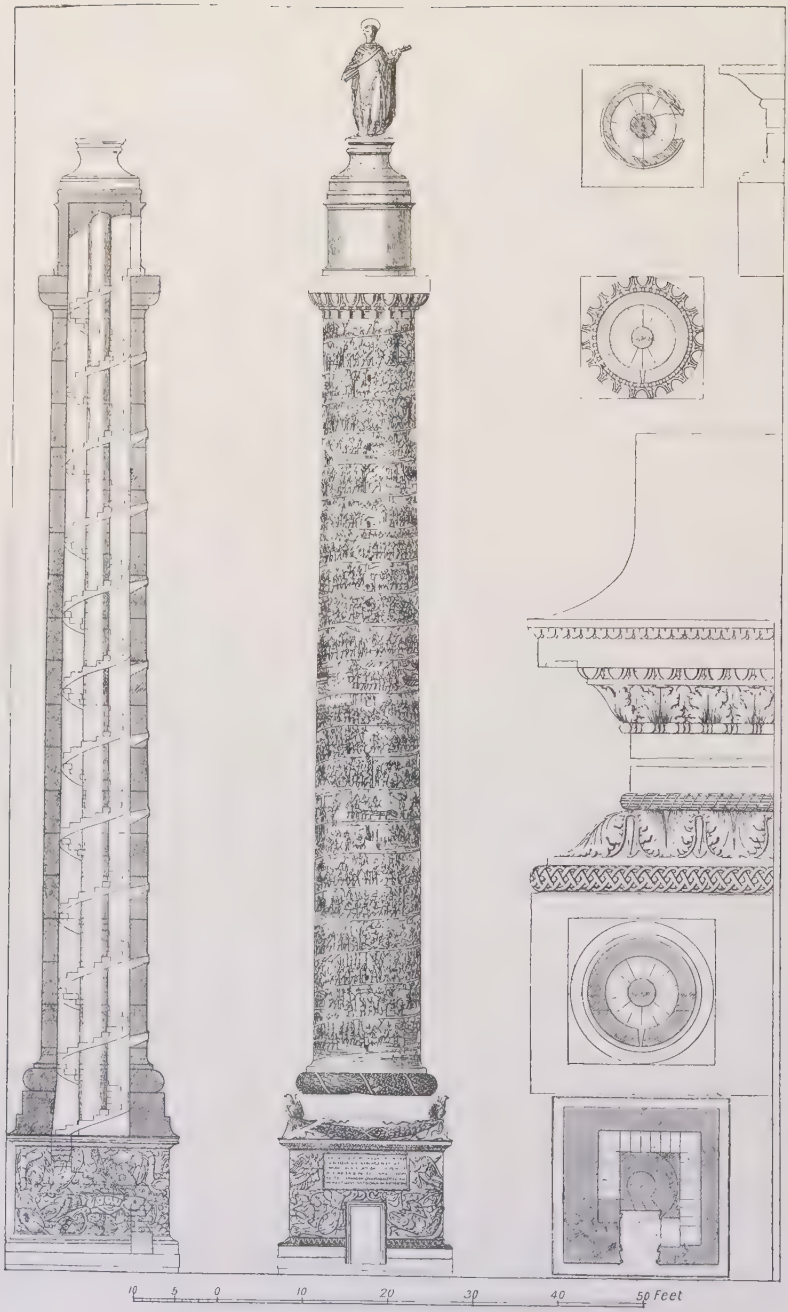
Plan of the
Forums at
Rome.

showing the Forum of Augustus, where it will be noted that the temple of Mars Ultor (Ill. 157, O) is built at the farther end of the site, thus giving an ample space to the Forum. As the temple was erected against a portion of the Quirinal Hill cliff, it was visible only from the front and sides, which may account for the wide difference between its plan and that of a Greek temple. Externally, far greater importance was given to the portico of the front; internally, a finer effect to the statue of the god by the apse in which it stood. The irregularity of the site at the back, on the right, has been balanced on the left, so that, as seen from the Forum, the two sides would appear to be symmetrical. In this Forum is one of the earliest examples known of that feature which seems to have had a special attraction for the Roman architect, viz., the hemicycle (P), and we can thus appreciate, on examination of the plan, the magnificent effect of the expansion of the farther end of the court by those semicircular walls on each side, decorated as they were with ranges of niches flanked by monoliths of coloured marbles and filled with statues, the whole of the rest of the surface of the wall being covered with slabs of coloured marbles.*

To return, however, to the new Forums, the first one added was that of Julius Caesar (Q), built on the north side of the principal Forum. It was rectangular in plan, and was surrounded on three sides by a porticus giving access to a series of vaulted chambers, which are assumed to have been legal offices. Portions of these still exist (S), to the simple architecture of which reference has been made (p. 159). In the centre of the Forum was the Temple of Venus (R), which is instanced by Vitruvius as an example of pycnostyle, or close intercolumniation. The temple was erected 46 B.C., and was peripteral hexastyle, of the Corinthian order, and built or cased entirely in white marble.

Reference has already been made to the next Forum built, *i.e.*, that of Augustus. To the Temple of Mars Ultor, which formed its chief architectural feature, we shall return again.

* In the restored plan made by Charles Dutert, Grand-Prix of 1864, the porticus is carried across the fronts of these hemicycles. In Dr. Middleton's plan (vol. ii. p. 3), and also in Canina, it stops short of them, possibly a finer arrangement so far as the effect of the great semicircular walls is concerned. Dutert's plan represents the conjectural restoration of the Forum as it was in 175 A.D., so that the Arch of Septimius Severus is not shown on it, and it includes only the discoveries made up to the year 1869, many years before the systematic excavation of the Forum Romanum was commenced.



158. THE COLUMN OF TRAJAN AT ROME.

The Forum built by Vespasian (Ill. 157), which is better known as the Forum Pacis, was begun in 71 A.D. It was situate about one hundred feet east of the walls of the Forum of Augustus, and was rectangular, with a porticus round it, and enclosed the Temple of Peace (L), of which no remains have been found.

The Forum of Nerva (Ill. 157) is the next in date, 88—98 A.D. It occupied a site between the Forums of Augustus and Vespasian, and the lofty walls on either side were decorated with a series of detached Corinthian columns of Greek marble, twenty-one on each side, with respond capitals only; two of these columns still exist, and show that above the entablature was an attic with plinth and cornice, the latter being returned round the corner, and probably carried statues to break the sky line. In the centre of the portion which remains is a relief of Minerva about life size. At the farther end of the Forum was a temple dedicated to Minerva (N), hexastyle and prostyle, with an apsidal termination to the cella similar to that of Mars Ultor. The Forum is about one hundred feet wide, and it must have had a magnificent effect with the side ranges of Corinthian columns.

The last Imperial Forum built, and by far the most magnificent, was that of Trajan (Ill. 157), which was designed by Apollodorus of Damascus, and covered an area equal to all the other Forums put together. The latest researches of Signor Boni have shown that portions of the substructure of this Forum go back to the time of Domitian, and were built on a site already covered with buildings of a more ancient date. The Forum consisted of three parts, viz., the Forum proper, the Ulpian basilica and the Temple of Trajan; the first was an open area surrounded by a porticus with a double row of columns,* and flanked on the right and left by two immense hemicycles; as the northern hemicycle had a series of shops and offices several storeys high, the upper rooms in which were entered from the top of the adjoining hill, it is evident that this feature was designed to mask the overhanging cliff of the Quirinal Hill, and (for the sake of symmetry) a similar hemicycle with shops and offices was built on the south side. The Forum was entered through a magnificent Archway (T), the design of which is known from coins. The farther side of the open area of the Forum was occupied by the Ulpian Basilica (Ill. 157),

* In Dutert's plan only one row is shown, insufficient, it would seem, to carry a roof of fifty feet span.

inaugurated 113 A.D., consisting of a vast central nave surrounded by a double range of columns in two storeys. At its north and south ends were semicircular apses (U), covered with hemispherical vaults. These apses were the law courts, and they may have been shut off from the basilica by curtains or screens, so as to mask the incongruity of the arcuated and trabeated styles in the great circular arch opening of the hemicycle and the double range of columns of the aisles carrying their entablatures.

In a central court beyond the basilica, which was surrounded by a peristyle two or more storeys high, stood the famous Column of Trajan (V) 114 A.D.; this was of the Roman Doric order, raised on a pedestal richly carved with reliefs of armour and trophies taken from the Dacians. Winding round the shaft (Ill. 158) is a spiral band of twenty-three revolutions, carved with relief sculpture representing the history of Trajan's campaigns against the Dacians. The shaft, built in large blocks of Greek marble, has a lower diameter of twelve feet, diminishing to ten feet under the capital. The whole column is one hundred Roman feet (97·6 feet) high, the pedestal eighteen feet high. On the top of the capital was a colossal bronze statue of the Emperor, thirteen feet high. On either side of this central court were libraries (Ill. 157, W), one for Greek, the other for Latin MSS. The third part of the Forum was occupied by the Temple of Trajan (Ill. 157), which was of the Corinthian Order,* octastyle and peristylar, mounted on a podium and approached by a flight of steps. The temple stood in a court surrounded on three sides by a peristyle in two storeys, and was probably an addition made to Trajan's Forum by Hadrian, who dedicated the temple to the deified Trajan.

The plans of the several forums we have been describing were governed to a certain extent by the sites selected, and the lofty walls by which some of them were enclosed would seem to have been deemed necessary to mask adjoining heights of cliffs, other buildings, and existing streets. In the provincial towns, as in Pompeii, throughout Europe and in the North of Africa, the enclosures of the forum were the principal temples and shrines, government buildings, as the Basilica, Senate House, etc., and Municipal Buildings, serving

* A monolith shaft of granite, six feet in diameter and fifty-five feet high, was discovered on the site in 1887, and probably belonged to the peristyle of this temple.

as markets. The forum itself consisted of an open rectangular area enclosed by a porticus or peristyle. On the foundation of a new town the first consideration would appear to have been the two chief thoroughfares, and these were laid out at right angles to one another, running as a rule north to south and east to west. In order to be as central as possible the forum occupied an angle of two of the streets, but there were always buildings between the street and the forum; the entrance to the central area of the latter being at one of the narrow ends, so as to interfere as little as possible with the covered porticus round it. The Forum of Pompeii, which may be taken as a typical example, was about five hundred feet long, north to south, and one hundred and fifty feet wide, in both cases including the peristyle. At the north end, projecting about one hundred feet into the forum, was the Temple of Jupiter, and an entrance gateway, the Arch of Tiberius, at the north-east corner. On the east side were in succession the provision market, the sanctuary of the city Lares, a small temple of Vespasian, the building of Eumachia (which was probably a cloth market) and the Comitium, or voting place. On the south side were three municipal buildings, and on the west side the Basilica, to the north of which was the Temple of Apollo in a court surrounded by a peristyle in two storeys; and, farther north, another market and latrines. Excepting the Temple of Jupiter the only other monumental features in the forum itself were statues raised on pedestals to various Emperors and distinguished citizens.

The Romans, as a rule, employed their own style of architecture, as developed during the first century of the Empire in Rome, throughout all their dominions. The construction of their buildings, however, varied sometimes on account of the materials at hand (which were occasionally of an entirely different nature to those in use in the Capitol), and at other times in order to avail themselves of the special labour of the country. In Syria, for instance, and more particularly at Baalbec, they employed immense masses of stone, not only for the substructures of the citadel, but in the temples themselves, which in dimensions are far in excess of those employed elsewhere.

M. Ernest Renan* and his coadjutors in fact arrived at the conclusion that the famous trilithon, the well-known group of

* *Mission de Phénicie*, Paris, 1864.

three stones, which forms part of the substructure of the great Temple of the Sun at Baalbec was the work of the Romans, who had employed the traditional Phoenician labour of the country. This is confirmed by other characteristics. Phoenician architecture was megalithic; when unable to find rocks of sufficient height wherein to excavate their dwellings, they employed stones of immense size, and aimed at obtaining joints of such fineness that the ultimate work appeared to be in one stone.* When working for the Romans (and employing the classic orders), both capitals and bases are carved in the same stone with portions of the shaft. This tradition was carried on in later times under the Christians, when the arch of an arcade was either cut out of a single block or divided into only three voussoirs. This special characteristic is found throughout Roman work in Syria, but for the moment our attention must be directed to the laying out of their towns, which in the eastern portion of Asia Minor and in Syria seems to have followed the traditional requirements of the country in the erection of what are known as "colonnaded streets." In consequence of the great size of the stones, and of the difficulty of utilising cylindrical blocks in the erection of more modern dwellings, a large number of columns still stand erect, like bleached skeletons, on the sites of the ancient cities. Owing to the great dangers involved in visits to these cities, and the very short periods during which it has been possible to stop there, no attempt has yet been made (beyond the general survey of that which remains above ground), to excavate and expose the foundations of the various buildings which constituted the town apart from its main thoroughfares. The folio volumes of Wood † and of Cassas ‡ give us the plans of the streets and of the principal temples of Palmyra, but of the buildings which flanked those streets there is no record. Many of the columns of the colonnaded streets remain *in-situ*, and the bases of others allow of a complete conjectural restoration of their extent being made; but the buildings outside the covered peristyle on each side (being built in coursed masonry, or only in rubble bedded in clay) have long since been removed and utilised to construct the walls of the town or houses for the numerous tribes which have since occupied the site.

* See Ills. 164 and 165, pages 203, 204.

† *Ruins of Palmyra*, London, 1753.

‡ *Voyage pittoresque de la Syrie et de la Phoenicie*, Paris, 1799.

From the writings of a Spanish Arab geographer who visited Damascus in 1184, and described what he thought was a great hall, but which is known from other sources to have been one of the colonnaded streets leading to the Great Mosque built on the site of the ancient temple, it may be gathered that the central space between the rows of columns was open to the sky, and that the side avenues were covered over with a terrace roof which extended over the shops and offices on each side, and that on this roof the occupiers of the chambers and shops passed the nights in the summer. The shops and residential chambers were in two storeys. This description applies to the great street at Palmyra, where a projecting cornice still exists on the side of the central avenue; and the trace of the terrace roof which covered the side avenue may be seen against the great archway which terminated a portion of the colonnade.

The earliest records of these colonnaded streets are those describing the city of Antioch, where Antiochus Epiphanes is said to have laid out (about 170 B.C.) a street with double colonnades extending more than two miles in length, with other streets crossing it at right angles. Herod the Great also constructed a new street there with colonnades similar to those which he had erected at Samaria, and many of the columns are still standing erect at the present day. With the exception of the latter, all the colonnaded streets in Syria belong to the Roman occupation; but the two bends in the main street at Palmyra suggest that it occupied the line of a more ancient thoroughfare. The central avenue of the principal portion of its main street (which runs from west to east), is thirty-seven feet wide, and is flanked by a row of columns thirty-one feet high on each side. There were originally four hundred and fifty-four columns in this street, of which one hundred and sixteen still stood erect in Cassas's time (1795 A.D.). The side avenues were sixteen feet wide, and at about six hundred feet from the eastern end was the centre of an important cross street. In some cases, as at Antioch, Bosra, Gerasa, and other towns, the intersection of two cross streets is marked by a four-arched gateway vaulted over. At Palmyra there were four immense pedestals only, each carrying a group of four columns, with their entablature. With this exception the entablature of the colonnade, measuring seven feet two inches high, and crowned with a blocking course or low attic, was carried straight through from end to end. In four

other cases where there were cross streets the columns were replaced by archways. At the eastern end of this street was an immense triple gateway (Ill. 159), with a central archway twenty-three feet six inches wide and forty-five feet high, and two side archways for pedestrians, eleven feet six inches wide and twenty-three feet high. The gateway was apparently

159.—THE GREAT ARCHWAY AT PALMYRA, SHOWING ON THE RIGHT-HAND SIDE THE COLUMNS OF THE PERISTYLE; IN THE DISTANCE IS THE TEMPLE OF THE SUN.

planned to mask the junction of the street just described with another street, seven hundred feet long, leading to the entrance propylaea of the great temple. It is triangular on plan, and seems to have been misunderstood by Wood, but is correctly shown in Cassas's work. The angle of the two streets (one to the other) is about 131°, and we assume that, after the temple, with its immense enclosure was built, it was thought

right to connect its entrance with the main street, and the great archway was designed for the purpose above mentioned.

In Damascus, the longest street, known as the "Via recta," ran from one gateway of the town to the other, and was 1,550 feet long. The main street of Gerasa was 1,880 feet long, of which one portion, about 1,300 feet, had a range of columns of the Corinthian order 25 feet high on each side, and the remaining portion, columns of the Ionic order, 20 feet high. This latter terminated in an immense circular piazza, apparently to change the line of axis to an important temple beyond. The remains of other colonnaded streets are found at Amman, Bosra, Gadara, Pella, Apamia, Kanawat, etc. They seem to have existed in every town, and are shown on early maps as existing in Jerusalem, and at Pompeiopolis, in the south of Asia Minor, a large number of columns still stand erect.

At Bosra, where the town was regularly planned within walls forming a rectangle, the main street ran from east to west, joining the two gateways of the city. This street was intersected by two other important streets running north and south, and at their junction were tetrapylons which were vaulted over.

The existence of these colonnaded streets did not obviate the erection of other public buildings, such as the forum, senate house, etc.; but with the exception of the temples, only the colonnaded streets have been traced in the surveys made.

Reference was made in Chapter VI. to the placing of tablets with dedicatory inscriptions on the columns of Greek temples. These existed throughout Syria, but the Romans did more than this, they erected statues as well. The shafts of the columns at Palmyra are in three drums of stone, the central one about two feet high only, with a corbel bracket (see Ill. 159) projecting inwards towards the central avenue to carry a statue. It was the custom of the citizens to raise statues to those benefactors who had contributed to the magnificence of the town by erecting buildings of public importance; but whether these corbels were all occupied, is not known. All the columns standing erect in the great street have these brackets, and also those of the peristyle or porticus round the peribolus of the great temple.

The principal temples in Syria would appear generally to have been enclosed in a great court, with lofty walls and porticus

round, similar to those of the Forums at Rome. The great court of the Temple of the Sun at Palmyra is about seven hundred and fifty feet square, the whole area being raised some sixteen feet above the general level of the town, and enclosed by a wall fifty feet high, which was entered through magnificent propylaea with a broad flight of steps in front. The twelve columns of the Propylaea are arranged in pairs, and the wider central intercolumniation suggests that an arch was employed

160.—THE WEST FRONT OF THE PROPYLAEA AT DAMASCUS.

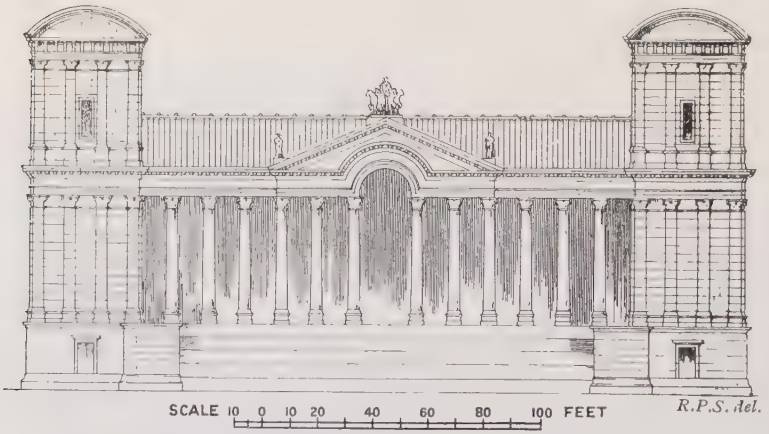
to span them instead of carrying through the architrave. The height of the front wall (west) was eighty-three feet, the peristyle on the inner side being sixty-one feet high (including column and entablature), and the width between wall and columns forty-five feet. The three other sides of the court had a double peristyle, with two rows of columns thirty-four feet high. At Damascus, the walled enclosure would appear to have measured one thousand one hundred by one thousand feet, with a double portico round, and two propylaea to the east and west respectively. The inner part of the western

Propylaea is still more or less perfect (Ill. 160). The extreme purity of its detail points to its execution within the second century of our era, and possibly in the first half. In comparison with the two great temples at Baalbec, built in the second half of the century, it exhibits little of that decadence of style which we find in the latter end of it, and, if it were possible to ascribe a still earlier date, it might be the work of the celebrated Apollodorus of Damascus, of whose services Trajan availed himself when laying out his Forum at Rome. There is one feature in it, however (*i.e.*, the arch spanning the central intercolumniation), which seems to be too startling a novelty for this early date. But a little later there is an example in the Temple at Atil (Ill. 161) in the Hauran, which was built by Antoninus Pius, and is dated by an inscription as A.D. 151. The Greek fret decoration of the architrave at Atil is so similar to that of this gateway at Damascus that the same date might be fairly claimed for it, and they both precede the well-known example at Spalato by one hundred and fifty-three years. In the great peribolus of Damascus the double portico appears to have been raised above the level of the city, and a flight of steps (as shown in Ill. 160) led down into the enclosed court, the temple itself being raised on a separate platform.

161.—CAPITAL OF THE TEMPLE AT ATIL, SHOWING THE SPRINGING OF THE ARCH BETWEEN THE TWO CENTRAL COLUMNS.

The most important of the Syrian enclosures is that found at Baalbec, where the principal temples were raised on an immense platform, which constituted an acropolis or citadel. Although at one time it was thought that the substructure of the north and west walls might have been, according to Renan, the work of the Seleucidae, erected on the site of a much earlier temple (that of the Temple of Baal, built by the

Phoenicians), there is no doubt now that the buildings constituting the whole acropolis formed part of one great scheme commenced by Antoninus Pius (138—161 A.D.). The whole structure is artificial, and the foundations were carried down to the solid rock, in some cases twenty-five feet below the ground, above which the height of the platform is twenty-five feet at the east end and thirty feet at the west owing to the slope of the ground. If one may judge by the megalithic masonry* employed, Antoninus Pius's work would seem to have been stopped when the structure was about thirty feet from the



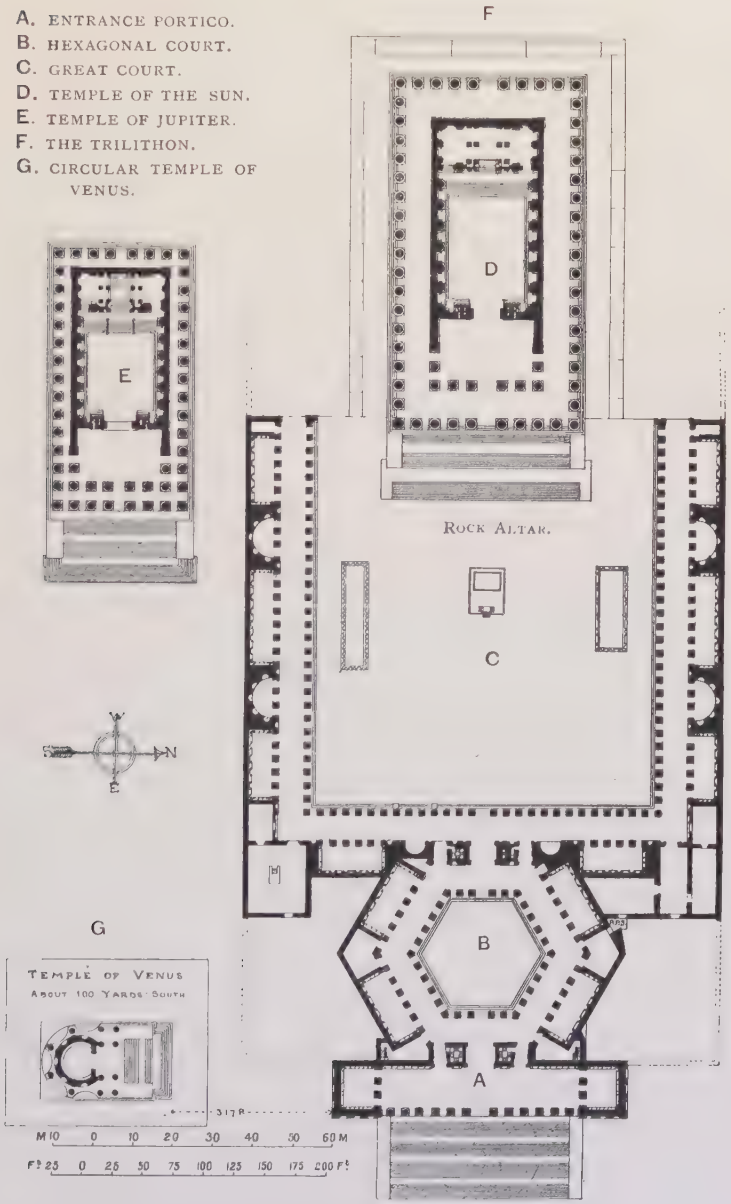
162.—CONJECTURAL RESTORATION OF THE PROPYLAEA AT BAALBEC.

ground, possibly on account of his death 161 A.D., and it was not resumed till many years later, probably by Septimius Severus (193—211 A.D.), the superstructure above that level being in masonry of far less dimensions.

The entrance to the citadel was on the east side. A flight of fifty-one steps, one hundred and fifty feet wide, led to the Propylaea † (Ill. 162 and A, 163), a block measuring two hundred and thirty-eight feet wide by forty-five feet deep, and consisting of a portico, one hundred and sixty-four feet wide, of

* The wall carrying the Propylaea is twenty-five feet high, and consists of four courses only of masonry; these dimensions are exceeded by others described on page 204.

† The illustration here given (No. 162) is based on the dimensions of plan made by Joyau, Grand-Prix de Rome, who spent six months there in 1865, but died before he was able to work out his conjectural restoration. It is a different version from that put forward by Donaldson in his work *Architectura Numismatica*, both being based on a well-known coin,



163. PLAN OF BAALBEC.

twelve Corinthian columns (on pedestals) in-antis, between two wings of thirty-seven feet frontage and forty-five feet deep.

The Corinthian order with its entablature was carried across the wings, with four pilasters on the front and a similar number on the returns. Wood conceived that there was an attic storey above the cornice; and in his conjectural restoration he carried one along the whole front above the portico, but there is no authority for it, and Prof. Donaldson in his *Architectura Numismatica*, basing his conclusions on a medal representing the Propylaea, assumed the square dies which rise above the entablature of the wings to be the bases of an upper range of Corinthian pilasters. The same medal shows that over the six central columns there was a pediment, and that the two central columns carried an arch similar to that in the Propylaea at Damascus. This portion of the temple was built by Caracalla, about 212 A.D. The portico was probably covered with a tiled roof rising from the cornice in front to the rear wall of the block, and intersected by the pediment roof in the centre. We find, therefore, in the Propylaea at Baalbec a type of design based on the Temple at Jerusalem, *i.e.*, a central columnar portico flanked by two towers. The same type existed in the Temple of Sia in the Hauran, built by Herod the Great.

Three doorways led from the Propylaea to an hexagonal court B, surrounded by a peristyle * resting on a stylobate of three steps. On four of the sides of this peristyle, and separated from it by columns and piers, were four rectangular halls of irregular plan. Three other doorways led to the great court (C), with a peristyle on stylobate of three steps on three sides. In the rear of this peristyle were eight rectangular and other halls, those on the north and south sides alternating with semicircular exedrae, these latter being vaulted in stone, and the halls and peristyles having roofs in timber. Underneath the whole ranges of these halls and peristyles in both courts, are vaulted corridors sixteen feet wide, showing that the outer portion of the great platform was artificial.

The Temple of the Sun (D) was axially placed at the further

* The discovery of these peristyles and the stylobate on which they rested, is due to the Germans, who have been excavating there since the commencement of 1899. In the centre of the court they found an immense altar with steps leading up to it, and marble enclosures of what were apparently shallow basins for water, one on each side.

end of the square court; it was of the Corinthian order, decastyle and pseudodipteral with nineteen columns on the flanks. The temple measured one hundred and sixty feet in front by two hundred and eighty-nine feet deep, and was raised in a lofty podium with an immense flight of steps leading up to it, of which the lower portion has been discovered by the Germans *in-situ*. Of the temple itself there remains part of the great stereobate walls which carried the columns of the peristyle, one side of which was utilised by the Moslems as the

164.—VIEW OF THE TRILITHON AT BAALBEC, SHOWING PLINTH COURSE AND SUBSTRUCTURE. THE X X INDICATE THE POSITION OF THE JOINTS.

north enclosure of their fortress. Only six columns of the peristyle remain standing on the south side, but portions of others are embedded in the north wall. These columns, which are sixty-five feet in height, carry still their entablature, which is thirteen feet high. The German archaeologists cleared out the interior, showing that the whole of the masonry of the substructure of the cella had been removed, part by the Christians when they erected their basilica, probably in the sixth century A.D., and the remainder by the Moslems to complete the enclosure walls of the citadel and of the town of

Baalbec. The excavators, however, laid bare the lower foundations of the substructure of the cella, and the conjectural restoration of the plan in Ill. 163 is based on these and on the design of the Temple of Jupiter, in which the cella wall with its architectural decoration (see Ill. 176) and the Sanctuary are in good preservation.

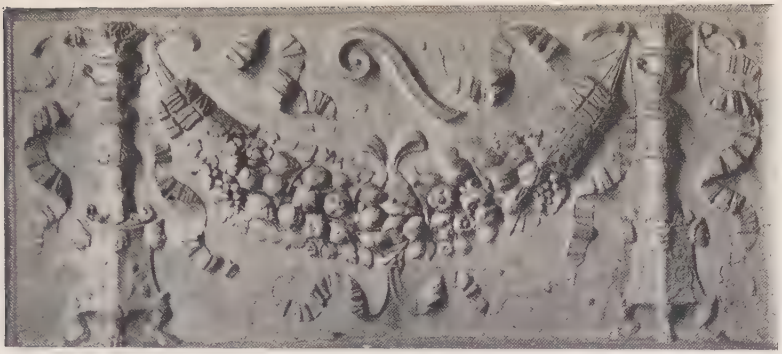
In the substructure of the west wall of this temple, and about twenty-five feet west of it, is the well-known "trilithon" (F) consisting of three large stones,* each of them being about sixty-three feet long, twelve feet high, and eleven feet thick, which are raised some twenty feet above the ground outside, on a plinth course of stones averaging thirty feet long each, and a substructure of smaller stones. The joints between these immense stones are so fine that it is impossible to insert the small blade of a knife into them. These great blocks of stone have been already alluded to (p. 199), and reasons given for attributing them to the Roman period. On this point Fergusson † states: "There seems no reason for doubting their being of the same age as the temples they support, though their use is certainly exceptional in Roman temples of this class."

In a court to the south of this temple, at a slightly lower level, was the Temple of Jupiter (E), and about three hundred and seventeen feet to the south and in the town is a small circular temple (G) to both of which reference will be made later on.

* For further description see the *Builder*, February 11th, 1905.
† *History of Architecture*, vol. i., p. 326.

165.—SITE OF THE QUARRY AT BAALBEC FROM WHICH THE STONES OF THE TRILITHON WERE OBTAINED.

The illustration shows another detached block *in-situ*, measuring 77 feet long, 15 feet high, and 14 feet thick, and weighing 820 tons. The columns of the Temple of the Sun on the left show that the three large stones had to be transported a great distance.



166.—GARLAND FROM THE PANTHEON AT ROME.

CHAPTER XII.

TEMPLES, BASILICAS, THEATRES AND AMPHITHEATRES.

THE Greek temples, whether peripteral or otherwise, were always isolated and intended to be seen on all sides. Except in a few instances, they were raised on a simple stylobate of three steps, and if built on the slope of a hill, as at Delphi, or on an irregular or low site, they were raised on a terrace or platform. The Romans, following probably Etruscan customs, erected their temples on a podium, with a flight of steps to the main front, flanked by projecting walls or spurs of masonry, along which were carved the mouldings of the podium. This, of course, gave a special importance to the main front—an importance which the Romans emphasised by an increased depth in the portico or pronaos. To have repeated this at the rear for the sake of symmetry would have had no value, unless the approach by the flight of steps were added. So little importance, in fact, did the Romans attach to the rear of their temples that even when the peristyle was carried on both sides of the cella it was generally stopped at the rear wall, which was carried through. This also was an ancient Etruscan custom; there may also have been other reasons. The Greek temple was always orientated, the principal front, with rare exceptions, facing the east. The Romans, on the other hand, attached no value to this principle, and as their temples were regarded not only as religious but as monumental structures, they were built on sites where they could best dominate

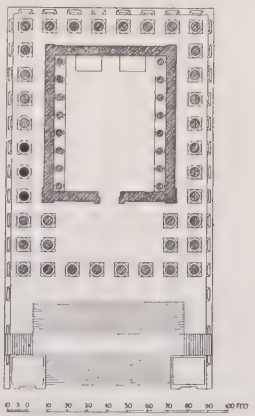
and be seen from the Forum, public place, or avenue which formed the chief approach. Thus in the Roman Forum they are found on all the four sides, and consequently face the four points of the compass. The Temple of Mars Ultor (Ill. 157 O) in the Forum of Augustus, and the Temple of Minerva (Ill. 157 N) in the Forum of Nerva, are placed at the farther end, so as to give a larger area in front, and, as we have already suggested, to mask the side of the hill excavated to obtain a level site. This position has apparently ruled the design of the plans, which must, when compared with Greek temples, be studied in conjunction with their surroundings; and in Rome this is even more important than with Greek temples.

Besides the temples already referred to, there were others in which the Romans followed more on the lines of the Greek temples, in that they were isolated and enclosed in areas surrounded by porticoes; such as the Temple of Venus in the Forum of Julius Caesar, the Temples of Jupiter and Juno in the Portico* of Octavia, the temple built by Hadrian and dedicated to Trajan in the rear of Trajan's basilica, the Temple of Neptune in the Portico* of the Argonauts, the double Temple of Venus and Rome, the Temple of Peace in the Forum of Vespasian, the Temple of Apollo at Pompeii, etc.

There is still another important difference between the Greek and Roman temples, viz., the increased size given to the cella. For this there may have been two reasons: firstly, the Romans by trussing the timbers of their roofs were able to roof over spans never attempted by the Greeks; and, secondly, the cella of the Roman temple virtually became a museum into which the greater part of the spoils of Greece, consisting of statues in marble and bronze, were placed. The increased size required for the cella may have led the Romans to adopt the pseudo-peripteral plan, in which the cella occupies the full width of the portico, the tradition of the peripteros being retained only in the engaged columns which are attached to the external walls of the cella. The principal examples of this are found in the Ionic tetrastyle prostyle Temple of Fortuna-Virilis already referred to, and the Corinthian hexastyle prostyle temple known as the "Maison Carrée" at Nismes, which is the best-preserved Roman temple in existence.

* We have retained the word "Portico," by which it is best known.

The work of the time of Augustus is, as a rule, more refined in its details than that of later times; but there were revivals in the time of Trajan, of Hadrian, and of the Antonines, when monuments were produced which for splendour of conception, magnificence of material, and vigour of execution have never been surpassed. Reference has already been made to the materials employed in Rome up to and during the reign of Augustus. To this Emperor is due the increased employment of marble, which previously had only been occasionally introduced as spoils from Greece. The marbles that were first employed were imported from that country, and, excepting those brought by Sulla* from Athens, used in the decoration of the Temple of Jupiter Capitolinus, were generally introduced into the mansions of the wealthy. Augustus not only embellished the city with splendid monuments, but induced others to follow his example, and hence his boast that he had found Rome of brick and left it in marble, the brick mentioned (lateres) being the crude brick which up to his time was almost universally employed for ordinary structures in Rome. The marble, however, was not used in the construction of the walls, as had been the case in Greece. The core of the Roman temple wall was concrete with brick facing, hard tufa or travertine; and an external casing (only) of marble, with slabs six to seven inches thick and solid cornices. Nor did the Romans always follow the usual Greek custom of building the shafts of their columns in drums. Monoliths of various marbles appealed much more to their sense of monumental effect. The white marbles principally used came from Mount Pentelicus, Mount Hymettus, and the Isle of Paros, in Greece, and from Luna near Carrara, in Italy.†



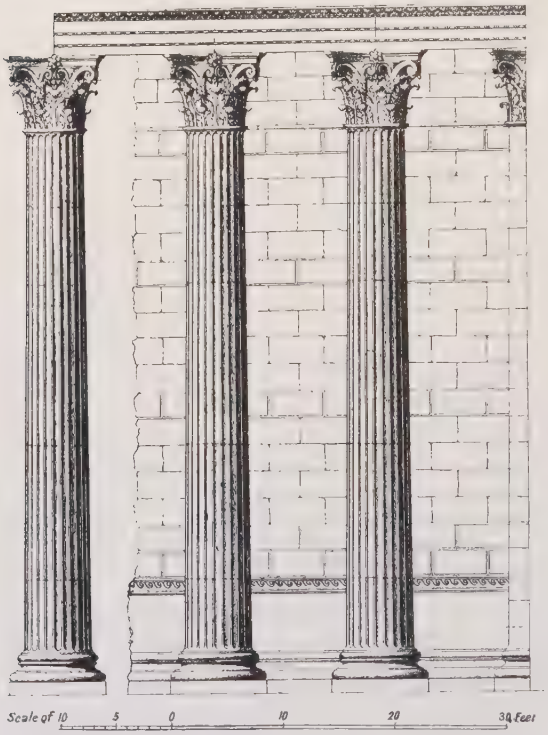
167.—TEMPLE OF CASTOR AT ROME.

Coming now to the principal temples of which there are remains existing, the Temple of Castor, 6 A.D. (Ill. 167), has

* See Penrose's *Athenian Architecture*, 2nd edition, p. 16.

† A list of these and of the coloured marbles are given in Prof. Aitchison's lectures at the Royal Academy in 1889, published in the *Builder* of that year, and also in Dr. Middleton's work on Rome.

already been referred to, in speaking of its order, as the most beautiful example in Roman architecture. The temple was octastyle and peripteral, with a portico in front three columns deep (Ill. 167). There were only eleven columns on the flanks, instead of from fifteen to seventeen, the usual number for a Greek octastyle temple. The temple was raised on a podium twenty-two feet high, faced with thin slabs of Pentelic marble, with a solid marble cornice and base. The three columns still standing and their entablature were of the same material. Internally on each side of the cella were eight detached columns raised on a dado, the latter serving as a pedestal for the statues placed between the columns. The columns carried an entablature, but served no purpose beyond that of decoration,* for the Romans, who were acquainted with the principles of trussed timbers, were able to roof over much greater spaces than the Greeks, who introduced columns inside the cellas of their temples in order to carry the ceiling and roof. A similar employment of the classic orders is found in nearly all the temples in Rome. Sometimes niches

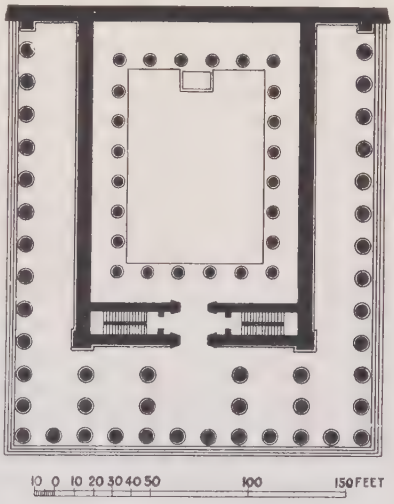


The distance of the columns from the cella walls is twelve feet.

168.—COLUMNS OF THE TEMPLE OF MARS ULTOR AT ROME.

* In the cella of a Greek temple the columns were introduced to assist in carrying ceiling and roof.

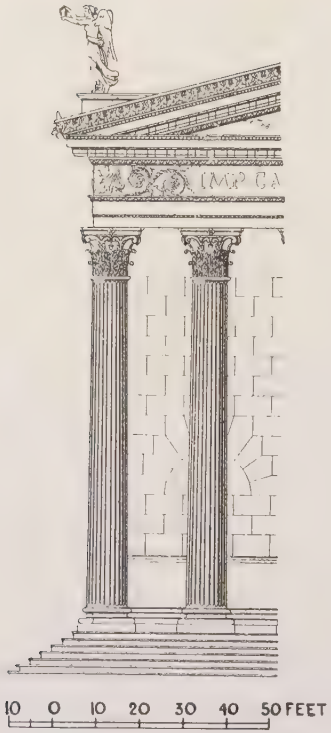
were sunk in the wall between the columns to give more space for the statues and works of art, and semi-circular apses at the further end, opposite the door, for statues of exceptional dimensions; one of these in the Temple of Mars Ultor is shown on the plan (Ill. 157 o). This temple, built by Augustus 14 B.C., was one of the most sumptuous in Rome; the columns, of which only three remain (Ill. 168), their responds, and the entablature were all in Luna marble. The cella wall was faced in the same material, with a dado suggested possibly by the vertical slabs round the cellas of the Greek temples. The sculpture of the foliage of the capitals and in the coffers of the ceiling of the peristyle is extremely vigorous in its execution, but not equal in refinement to that of the Temple of Castor.



169.—TEMPLE OF THE SUN AT ROME.

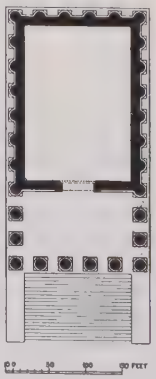
Although of much later date, the Temple of Antoninus and Faustina (142 A.D.) bears witness to a purity of style similar to that which characterises the work of Augustus; and as the frieze is a reproduction of an ancient Greek frieze at Delos it is probable that in this case a Greek artist was employed. It is not possible, therefore, in Roman work to decide, as in the case of Greek architecture, the approximate period of its execution. Some of the architecture of the first century is almost as debased as that of the third century, and it would seem to have been a question of the architect employed. The entablature of the Temple of the Sun in the Colonna gardens, on the Quirinal Hill (Ills. 169, 170), built by Aurelian 271 A.D., is quite equal in its design and execution to the work in Trajan's Forum, a century and a half earlier.

Of the temples in the Forum, the Temple of Concord (Ill. 157 D), built against the Tabularium, departs from the usual plan, the width of the cella being nearly twice its depth. The portico also only extended across the centre portion, leaving



170.—TEMPLE OF THE SUN AT ROME.

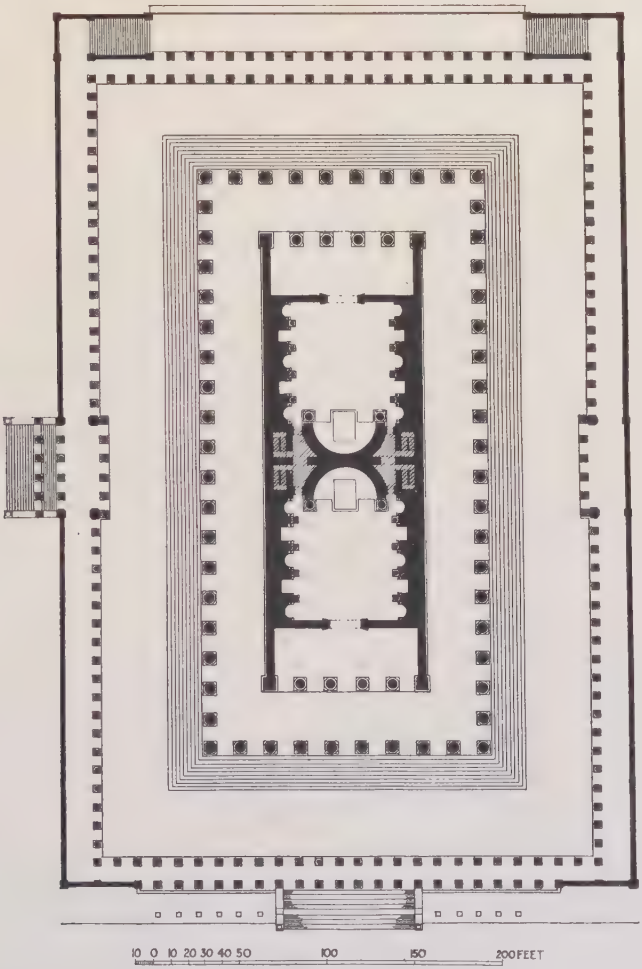
one bay on each side, in which a niche with a statue in it is shown in the medal of Tiberius. The temple was rebuilt by Augustus B.C. 7, and the carving of the capitals and entablature (now in the Museum of the Capitol) is of great beauty, though exception may be taken as to the propriety of introducing into the capitals rams' bodies of the order inside the cella (see Ill. 144, page 178), with their heads and horns taking the place of volutes. The plan of the temple is of interest as suggestive of the type adopted by Agrippa for his temple dedicated to all the gods, viz., the Pantheon, to which reference will be made later on. A less-known temple of the Augustan era is that of Minerva at Assisi, the capitals of which belong to the Graeco-Roman type found in the Temple of Castor and Pollux at Cora (Ill. 143). Perhaps, for want of space in front, the steps at Assisi (see Ill. 134, page 185) are carried back between the columns, which are raised on pedestals, the only instance of this arrangement in Italy, though examples are occasionally found in Syria. Outside Italy the most perfect Roman Corinthian temple existing is that known as the Maison Carrée at Nismes, built by Antoninus Pius and dedicated to his adopted sons Lucius and Martius (Ills. 171, 172). Hexastyle, pseudo-peripteral, with a portico three columns deep, it is well-proportioned, and its sculpture is comparatively pure for provincial work. The temple measures 59 feet by 117 feet, and is raised on a podium 11 feet high, with a flight of nineteen steps. The columns are 30 feet 6 inches high, with a diameter of 2 feet 9 inches, and intercolumniation of two diameters.



171.—MAISON CARRÉE PLAN.

172. THE MAISON CARRÉE AT NISMES.

Nothing definite is known as to the nature of the ceilings of the Roman temples, which may have been horizontal, with deep coffers (a type of design which would be in harmony with the



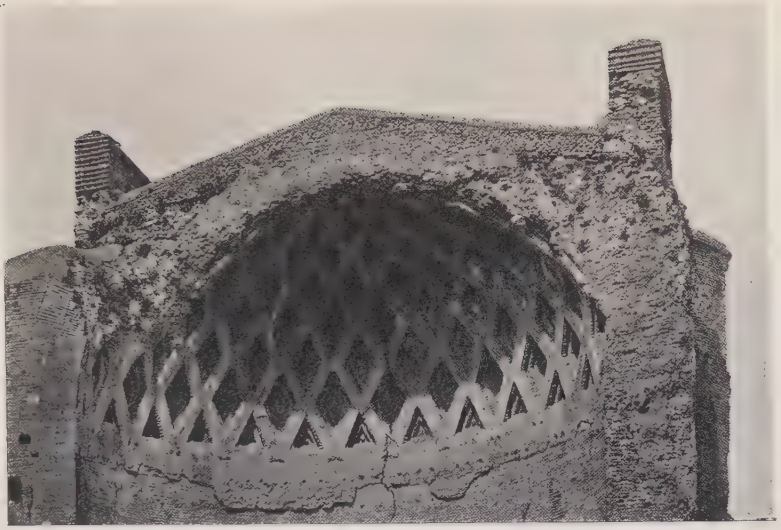
173.—THE TEMPLE OF VENUS AND ROME, AT ROME.

marble ceilings of the peristyles), or else open roofs richly decorated, such as are seen in the earliest Christian basilicas of Rome. The roof of Trajan's basilica is described by Pausanias as being of bronze, but whether that referred to its external covering in the place of tiles, to the ceiling inside cased with

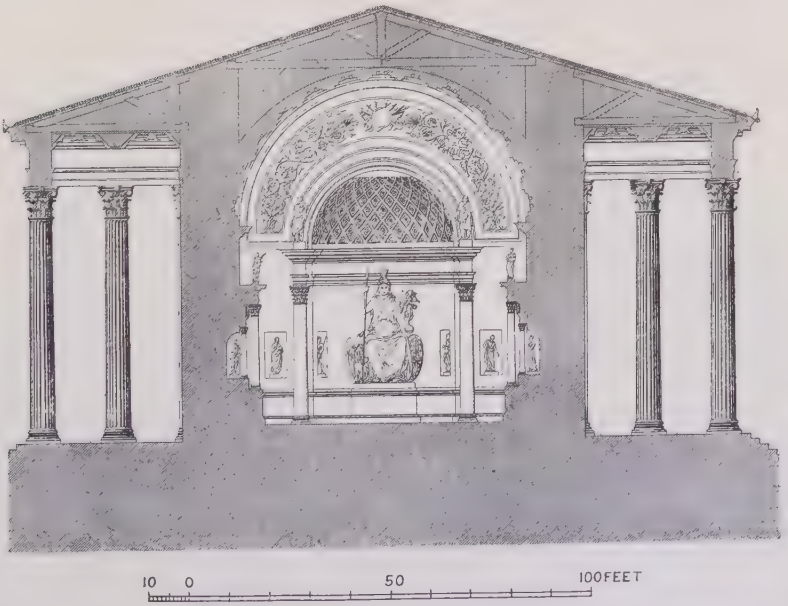
bronze plates, or to the employment of trusses in bronze, is not known. The roof of the Portico of the Pantheon, rebuilt by Severus and Caracalla, consisted of three trusses of bronze plates, two vertical and one horizontal, riveted together with bronze bolts,* and is supposed to have carried a semicircular ceiling, also of bronze plates, probably decorated with coffers and ornaments in relief richly gilded. Considering the great risk which such roofs (whether in bronze or wood) ran in their destruction by fire, it is singular that the Romans, who already in their amphitheatres, palaces, and thermae, had shown the most perfect acquaintance with the science of vaulting, should not have considered it essential to adopt this method of roofing their temples, which contained by far the richest treasures, for it is a fact that, except in the later work at Spalato, there are only four Roman temples in Europe known to have been vaulted over, viz., the Temple of Neptune (86 B.C.), the Temple of Venus and Rome (131—35 B.C.) (Ills. 173—175), and the Temple of Ceres and Proserpine, all in Rome, and the structure at Nismes in France, known as the Baths of Diana. The second-mentioned, built by Hadrian, was one of the most magnificent of the Roman temples. It had two cellas, each with apses set back-to-back, and a pronaos, the whole being surrounded by a single peristyle, with ten columns at each end, and twenty on the flanks. The side walls of the cella were of extra thickness to carry the vault, and niches were sunk in them to hold statues, with the usual decorative treatment of columns between; the apses were vaulted in coffers (Ills. 174, 175). The temple was enclosed in a peribolus, with porticus all round (Ill. 173), the columns being in granite or porphyry, the whole being raised on an artificial platform in accordance with the advice of Apollodorus. Although far less in size than some of the sacred enclosures in Syria, this temple and its enclosure occupies the largest area of any in Rome, measuring five hundred and forty-one feet by three hundred and thirty-seven feet.

The temple at Nismes, known as the Baths of Diana, is in its construction the most advanced in the science shown in its vaulting, and might fairly in that respect be taken for an eleventh

* This is the description given in Prof. Lanciani's *Ruins of Ancient Rome*, in which a drawing is published made by Dosio, an Italian architect, prior to its destruction by Urban VIII. There is also a drawing of the trusses by Andreas Coner in the Soane Museum, and a third by Philibert de l'Orme, a reproduction of which was published in the *R.I.B.A. Journal*, Vol. XXI., 3rd series.



174.—VAULTED APSE OF THE TEMPLE OF VENUS AND ROME.



175.—TRANSVERSE SECTION OF THE TEMPLE OF VENUS AND ROME.

century church in Provence. The cella is spanned by a transverse ribbed vault, virtually a barrel vault with stone ribs underneath, rising above the detached columns on each side of the cella, the definite purpose of which would seem to have been to lessen the span of the ribs, as they are brought forward to the same plane as that of the architrave below. Outside the cella walls are narrow aisles, over which a barrel vault is thrown to resist the thrust of the cella vault, an arrangement adopted in French Romanesque churches of the eleventh and twelfth centuries.

If the architect of the Temple of Jupiter* at Baalbec (see Ill. 163, page 201) had utilised the semi-detached columns and piers in the same way as in the temple above mentioned at Nismes, viz., by bringing the vault forward, it is quite possible the cella might have been vaulted. The columns there, however, as in Rome, were used only for a decorative purpose; there would be no height for a circular vault, as shown in Wood's restoration, and a segmental one could not have stood.† The temple itself is one of the best preserved in Syria, and is built in masonry of great size. It is difficult to understand why the architrave and frieze of the great doorway should have been constructed as a flat arch with voussoirs, seeing that in other parts of the temple there are stones of far greater dimensions than the width of the doorway. The temple was octostyle, peripteral, with a portico of four columns deep, and a double row of columns in front, the inner row being fluted. The cella was decorated with semi-detached Corinthian columns (Ill. 176) against piers, the entablature returning round both columns and piers. Between the piers were niches in two tiers. At the western end (see Ill. 163, page 201) was a square sanctuary, about half the width of the cella, the floor of which was raised ten feet above the ground, with a flight of steps in front; steps on each side led down into a vaulted chamber below the square apse. It should be noted that in this temple, as possibly in the great Temple of the Sun, the intercolumniation of the two central columns is greatly in excess of the others, so that there is every reason to suppose that it was spanned by an arch instead of an architrave.

* Judging by the sculptured friezes lately discovered the temple was probably dedicated to Bacchus.

† The same remark applies to the vault shown over the portico. In Wood's work the cornice in the cella is drawn six feet too low down, as the entablature of the portico and cella are on the same level.

176. CELLA OF THE TEMPLE OF JUPITER AT BAALBEC.

The Temple of the Sun at Palmyra departs from the usual plan of Roman temples in Syria, in that its main axis is north and south, and that one of the long sides, viz., the west, becomes the principal front. The temple is octostyle and pseudo-dipteral, with fifteen columns on the east and west sides. The principal entrance doorway on the west side (probably added by Aurelian when he restored or rebuilt the temple) is not quite in the centre of the main front, and has been emphasised, first, by adding engaged columns to the central column of the peristyle and its neighbour (towards the north), and breaking the entablature round them; and, secondly, by building the architrave and lintel of a great doorway between these engaged columns. This doorway, though not in the centre of the great court or of the temple, lies on the central axis of the Propylaea. The columns (sixty-five feet high) were probably of the Corinthian order, but the ornamental portions of the capital, including the abacus, have disappeared, leaving only the bell, the holes in which suggest that it was encased with metal decoration.

There are other temples in Palmyra of smaller size. In one, the Temple of Neptune, the six Corinthian columns of the portico are raised on pedestals, which stand on a stylobate of three steps. Reference has been made already (p. 186) to other temples in Syria in which the same arrangement is found; unfortunately none of these temples have yet been properly examined or described.

Among the temples in North Africa there is one example at Sbeitla (Sufetula) which varies from any we have hitherto described. The temple consists of three sanctuaries standing side by side (about sixteen feet apart), each on a separate podium, with flights of steps in front. All three structures are tetrastyle, prostyle and pseudo-peripteral, but the central temple, of the Composite Order, has semi-engaged columns round the cella, the side temples having pilasters only of the Corinthian Order round the cella walls. The three temples are placed at the end of an enclosure surrounded by a peristyle, with a series of small chambers at the back. The whole area covered measures about two hundred feet wide and two hundred and forty feet deep, and the entrance is through a fine gateway with centre and side arches, flanked by columns on pedestals. The central intercolumniation of the middle temple was, according to Bruce, spanned by an arch instead of an architrave. The

177. THE TEMPLE OF VESTA AT TIVOLI.

temples belong to the age of Antoninus Pius, in whose time this change from the custom in Rome seems to have been very general in provincial work.

Circular Temples.

If the rectangular Greek cella owed its origin to the megaron or hall of the King's Palace, the circular Roman cella may have derived its form from the circular hut of Romulus, so that its origin is Etruscan, although examples of circular temples exist at Epidaurus and Olympia. The cella of the Temple of Vesta at Tivoli (Ill. 177) is, from its construction, assumed to be earlier than the peristyle which surrounds it, and which from its purity of detail dates probably from the Augustan era. The cella is twenty-one feet in diameter, and is surrounded by a peristyle of eighteen Corinthian columns eighteen feet five inches high, the whole resting on a podium six feet high. The roof was probably in one pitch, rising to the centre, and covered with tiles. The cella still retains one of its two windows and the doorway, with a flight of steps in front. The columns are only about nine and a quarter diameters high and the capitals one diameter, this sturdy proportion being adopted probably on account of its position on a cliff. The foliage of the capitals seems to have been derived from the acanthus-mollis, and their carving, as well as that of the festoons of fruit and heads of oxen on the frieze, is of an extremely vigorous type.

178.—THE TEMPLE OF VESTA AT ROME.

The more celebrated Temple of Vesta (Ill. 178) was the temple in the Forum, close to the house of the Vestals. This was founded by Numa Pompilius 715 B.C., and frequently destroyed and rebuilt. The latest temple was that built by Septimius Severus about 200 A.D., of which the remains have lately been found. It consisted of a circular cella with peristyle of twenty Corinthian columns, raised on a podium fifty feet in diameter and six feet six inches high, the total height to the top of cornice being twenty-eight feet. The mouldings of the entablature, as also those of the cornice and plinth of the podium, were elaborately carved. On the podium were projecting dies, forming pedestals to the

columns, the moulding of cornice and plinth being returned round them—a peculiarity not found in the temple at Tivoli.

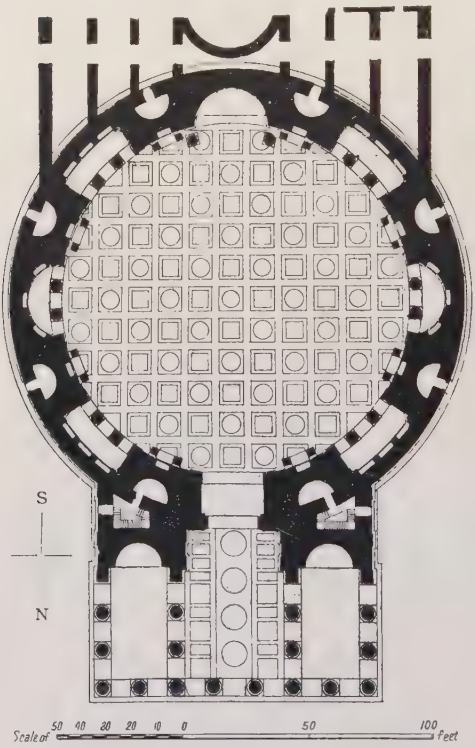
The circular temple in the Forum Boarium, generally described as the Temple of Vesta, is now known to have been dedicated to Mater Matuta, and although of early foundation was probably rebuilt in the Augustan era. The whole of the temple is built of Parian marble, including the flight of eight marble steps, some of which are buried; originally there was a podium six feet in height. The peristyle consisted of twenty Corinthian

179.—THE CIRCULAR TEMPLE AT BAALBEC.

columns, of which only one is missing, and the foliage of the capitals varies in design, though they all appear to have been carved by Greek artists. This temple was at one time thought to be the Temple of Hercules founded in the earliest days of Rome, and rebuilt by Vespasian; but drawings made by Peruzzi before its destruction in the fifteenth century show that this Temple had a peristyle of columns of the Doric order.

There are two other small examples of circular temples, besides the Temple of Jupiter at Spalato (described p. 297), viz., the Temple of Roma and Augustus on the Acropolis at Athens (L Ill. 52, p. 69), which rested on a square podium (Ill. 253,

p. 331), and consisted of a peristyle of nine Ionic columns with a diameter of twenty-three feet, and the Temple of Venus at Baalbec (G Ill. 163, p. 201) with a tetrastyle portico leading to a circular cella round which are detached columns carrying a cornice which sweeps back with segmental curves (Ill. 179), designed to meet the difficulty of the junction between the entablatures of a circular temple and a rectangular portico.



180.—PLAN OF THE PANTHEON AT ROME.

The largest circular temple, and in some respects the most remarkable monument ever built, is the church known as the Pantheon, which consists of an immense rotunda one hundred and forty-two feet in diameter and one hundred and forty feet high internally, with a wall surrounding it twenty feet thick.

The rotunda is preceded by a Corinthian portico (Ill. 182) one hundred and one feet wide and fifty-nine feet deep in the centre. The portico is octastyle and three columns deep, there being two additional rows of two columns each behind the third and sixth columns. Some of the columns are of marble, and some of granite. The masses of wall which form the responds (if they may be so called) of the portico have two large niches sunk in them, and were built and bonded into the rotunda during the course of its erection.

On the right and left, W. and E. of the central axis of the rotunda, are two apses (Ill. 180) in the thickness of the wall, each rising to the height of the main cornice of the lower order,

181. THE INTERIOR OF THE PANTHEON AT ROME.

and having two columns in-antis in front. At the farther end of the church is a similar apse, but of greater height, as the cornice of the lower order becomes the impost of the hemispherical vault which crowns it. The entrance doorway has a barrel vault of similar height. In the axes of the four diagonals are four rectangular chapels, with two columns in-antis in front of them. There are other recesses between these several chapels, lessening the amount of solid wall. The hemispherical dome of the rotunda has vertical and horizontal ribs, forming a series of deeply-sunk coffers.* There are thirty-two vertical ribs and five ranges of coffers, which rise to where the horizontal diameter of the dome is eighty feet. Above this the vault is not coffered, but there is a central opening thirty feet in diameter through which the church receives its only light. The effect produced by this great opening to the light of heaven is most impressive, and, as Fergusson says, "it is by far the noblest conception for lighting a building to be found in Europe." The lower order is forty-two feet six inches high (Ill. 181), and the attic order twenty-eight feet six inches.

Externally the walls are faced with opus reticulatum in brick, and divided by two strings or cornices. Up to the lower string the walls were originally faced with marble, and above this string with stucco, decorated with pilasters, as shown in Palladio's *Architectura*.

The Pantheon was originally considered to have been built by Agrippa in consequence of the inscription on the portico, and the style and character of the Order. But the discoveries made by M. Chedanne in 1892 proved that the rotunda was erected by Hadrian 120—124 A.D., and that the portico was partly built of the materials of Agrippa's temple, which was taken down at a later period, and re-erected to form the entrance portico to the Pantheon. Subsequent excavations have shown, 1; that the temple built by Agrippa consisted of an oblong cella with a portico of ten columns facing the south †; 2; that in front of this temple, viz., on the south side, was an immense circular piazza, of which a portion of the enclosing wall concentric with and contiguous to the rotunda has been found; 3; that this circular

* The upper and lower set-backs of these coffers, which were probably decorated with carved mouldings, are inclined upwards, so as to display them to the spectator in the church.

† The present portico faces north.

piazza was uncovered, as its pavement, found eight feet below the floor of the Pantheon, sloped downwards from the centre to the circumference*; 4; the rotunda was built on the site of the circular piazza,† some seven to eight feet above the pavement of the same; and 5; at a subsequent period Agrippa's temple and its portico were taken down and rebuilt at a higher level, to form the portico of the existing Pantheon facing north.

In rebuilding the portico it was made octastyle instead of

182.—THE PANTHEON AT ROME.

decastyle,‡ the eight columns of the front resting on what must have been the rear wall of Agrippa's cella. The marble monolith columns probably belonged to Agrippa's portico; the granite§ columns in the rear were obtained when the portico was re-erected. The entablature, with the inscription on the frieze, and the pediment also belonged to Agrippa's

* It is probable that this piazza was surrounded with a portico, the foundation walls of which were uprooted when the rotunda was built.

† This may have suggested to Hadrian or to his architect the idea of a rotunda to occupy the whole site of the piazza.

‡ The foundation walls of travertine are one bay or intercolumniation wider each side than the present portico.

§ Granite was not imported into Rome before Trajan's time.

temple, and with reference to the latter M. Chedanne made a singular discovery in the course of his minute examination. Agrippa's pediment, belonging to a decastyle portico, was of less pitch than the existing pediment, and the marble blocks of its cornice re-employed were inclined at a steeper angle; consequently the sides of the modillions, which originally were vertical, have a slight inclination towards the centre of the portico.

M. Chedanne's discovery of the actual date of the rotunda was due to his having obtained permission to examine the brickwork of a portion of the vault in which great cracks had appeared, and a special scaffolding having been erected, he was able to take out some of the bricks, which, to his surprise, were stamped with dies known to be of the time of Hadrian. Further examination was then made in other parts of the structure, in every case resulting in the discovery of similar stamps. M. Chedanne's researches, however, did not end there. He had already noticed that the cracks came over one of the rectangular chapels, and from this and other observations he came to the conclusion that the columns forming the front of these chapels were part of the original construction, and were not decorative features inserted afterwards. These cracks necessitated the removal of some of the stucco facing of the attic storey and revealed, 1; that above the entablature of these columns there was an immense relieving arch of similar dimensions to those over the entrance doorway and the principal apse; 2; above the columns were vertical piers of brickwork rising to the soffit of this relieving arch; and 3; between each of the three divisions were small discharging arches. In a restoration made in 1747 the architect had cut through all the central discharging arches in order to obtain a greater depth for his niches, being unaware that they were integral portions of the main construction. This was the origin of the cracks, which had become so serious in 1892. Carrying his researches further, M. Chedanne found that above the cornice of the attic storey was a second relieving arch* of similar size to the one below, with vertical piers over those below, and other small discharging arches. The wall, therefore, was vertical up to the inner coffer of the second

* All these relieving arches were not, as has been suggested, skin deep, but carried back some eight feet.

range, so that the vertical ribs already referred to and the first horizontal rib were actually built out in front of this vertical wall.

M. Chedanne also found that the whole thickness of the vault was built in brick laid in horizontal beds* up to the level of the fourth range of coffers (or about two-thirds of the height of the dome), and also in the proximity of the central opening in the vault. It was not possible to examine the vault between the fourth range of coffers and the central opening, and here, where the diameter is reduced to about eighty feet, according to M. Chedanne, a series of arches may have been built round on a regular centering.

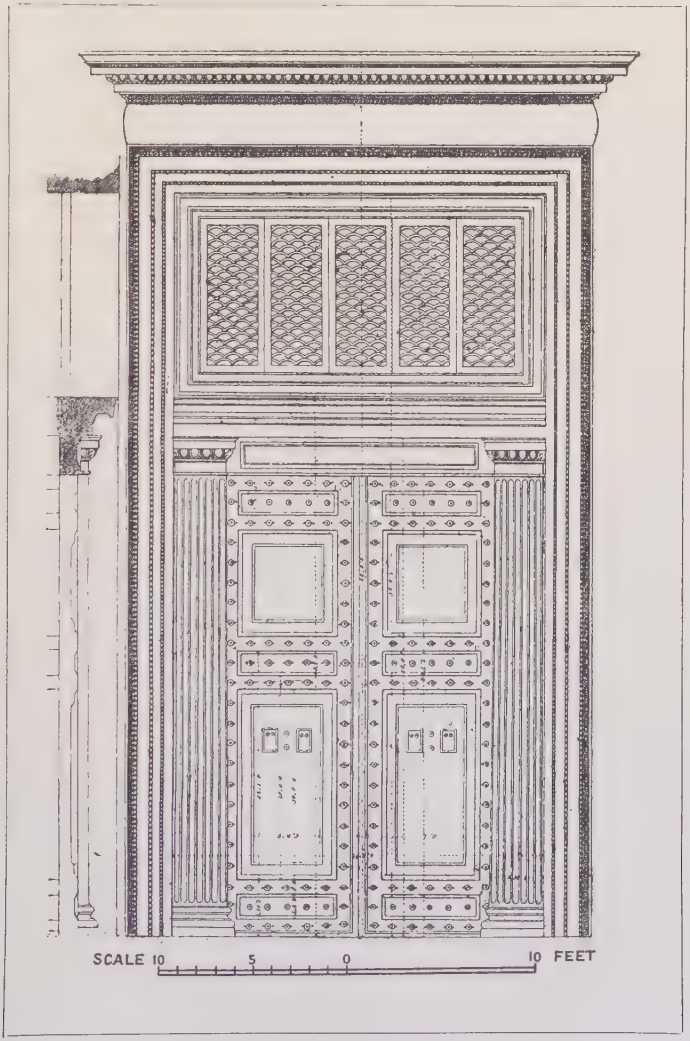
It has hitherto been assumed that the marble decoration of the interior was originally carried out during a restoration by Septimius Severus and Caracalla; but we have already shown that the columns in front of the chapels form an integral part of the structure. From this it may be inferred that the construction and decoration formed part of the original conception of Hadrian's architect, for both the responds of these columns and the entablature formed a necessary sequence. The marble wall decoration between the chapels may have been completed at a later period, and the niches with columns, entablature and pediments added afterwards. The attic storey was originally decorated with a series of marble pilasters, with panelling between, the design of which is shown in Palladio's *Architectura*, and in two of Piranesi's plates *c.* 1751 A.D. Piranesi in his description says that the pilasters were in porphyry, and the panels in giallo antico, pavonazetto and serpentine—*i.e.*, green porphyry. The capitals were in white marble.†

All this marble panelling on the attic storey was taken away in 1747, and the present decoration in stucco (Ill. 181) probably dates from that time, as it is so shown in a later engraving of Piranesi's published about 1761. The coffers of the vault were all gilded with bronze centre flowers, of which M. Chedanne found the bronze bolts in the vault. The great circular opening in the centre of the vault still retains its bronze cornice, a drawing of which by Philibert de l'Orme is given in the Baron de

* The so-called horizontal beds slope down outwards about one inch in two feet.

† Eight of the capitals of these pilasters are in London, viz., six in the British Museum, one in the Royal Academy, and one in the Soane Museum.

Geymuller's work, *Documents inédits sur les thermes d'Agrippa*, 1883. The external roof, part of which is stepped, was originally



183.—BRONZE DOOR OF THE PANTHEON AT ROME.

covered with bronze plates gilded. These were, however, stripped off, and subsequently replaced with lead. The ceiling of the portico was semicircular, and consisted originally of

bronze plates. The massive doors (Ill. 183), with their fluted Tuscan pilasters on each side, and the grating above, all in bronze, and originally plated in gold, are the best preserved examples in Rome. The doors are framed with large plates of cast bronze, the cyma-recta mouldings and the decorative bosses being also cast.

185.—PORTION OF THE DOUBLE AISLE OF THE BASILICA JULIA.

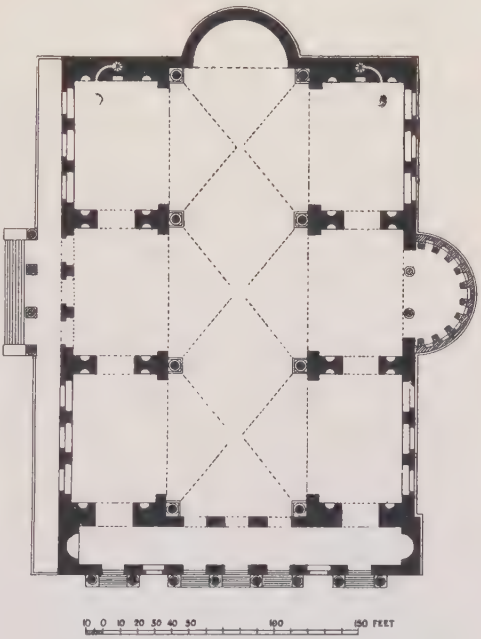
Basilicas.

The first basilica built in Rome was the Basilica Porcia, erected in 184 B.C. by Porcius Cato, who provided it to relieve the overcrowding in the Forum. A portion of it was set apart as a court of justice, and the remainder served as an exchange for merchants. A second basilica followed in 174 B.C., which again was pulled down in 54 B.C. to make way for the Basilica Julia, the complete plan of which is now laid bare in the Forum, as shown on the right of Ill. 184. The central area of the Basilica Julia was two hundred and sixty by sixty feet, and it was surrounded by a double aisle of arches resting on piers, with transverse arches carrying quadripartite groined vaults (Ill. 185). Over the outer aisle was a flat roof on one side overlooking the Forum, and

184. THE FORUM AT ROME FROM THE WEST.

probably occupied by spectators when meetings were held there, and above the inner aisle a gallery overlooking the central area. Externally the lower storey was decorated with engaged columns of the Doric order between the arches, and on the upper storey, the wall of which was set back on the central line of piers with Ionic pilasters.

The Ulpian basilica (Ill. 157, p. 190), though covering an area slightly less, had in addition two great semicircular halls which constituted the courts of justice. Architecturally its interior must have presented a much finer appearance than the Basilica Julia, as monolith columns took the place of the arcade piers. The plan was similar to that of the Basilica Julia, with a central area with double aisles all round and enclosure walls on the two longest sides. All the shafts of the columns of the ground storey were of red granite from Syene, in Egypt, with Corinthian capitals of white marble. Galleries are supposed to have been carried over both aisles. As regards its roof, Canina in his restoration shows a horizontal ceiling with deep coffers and a trussed roof in timber, and he lights the interior by clerestory windows above the galleries. Fergusson, on the other hand, assumes the roof to have been in bronze and semicircular, carried by bronze trusses or girders similar to those which existed over the Portico of the Pantheon; and as Pausanias says the roof was all in bronze, there seems to be some authority for having a semicircular roof rather than a horizontal one, as in the latter case the bronze plates would have a



186.—THE BASILICA OF CONSTANTINE AT ROME.

tendency to buckle. There is still a further reason which may have led Fergusson to his conjectural restoration, and that would be the utter incongruity of an immense horizontal coffered ceiling over the hall, and a domical coffered vault over the hemicycle.

The third great Basilica, sometimes called the Temple of Peace,* was commenced by Maxentius and completed by Constantine (Ill. 186). It is half as large again as either of the other two just described, and is totally different in its nature and construction, being virtually a reproduction of the vaulted hall of the Thermae known as the Tepidarium. It consists of an immense hall two hundred and sixty-six feet long (exclusive of apse) by eighty-two feet wide and one hundred and fourteen feet high, divided into three bays, and covered with an intersecting barrel vault, and aisles or side halls fifty-five feet deep. To lessen the span the vault is brought forward and carried on detached columns, and between the walls contrived to resist the thrust are three rectangular halls on each side; these communicate one with the other through large doorways, so that they virtually constitute aisles. The vault of these halls or aisles on the north side still exists, and displays deep coffers all built in brick (Ill. 187). There were two hemicycles, one opposite the main entrance in the centre of the south front, the other at the west end. This great vault is one of those instances to which reference has been made in Chapter IX. as of construction possible only with pozzolana; and the homogeneous nature of the vault is shown in the fact that although the columns which were supposed to carry it have gone, an immense mass of overhanging concrete has stood unmoved for ages.

The Basilica Aemilia, on the north side of the Forum, was celebrated as the most beautiful example in Rome, probably on account of the magnificence of the marbles† employed in it. The site is now (1907) being excavated, and already some fine sculpture has been found.

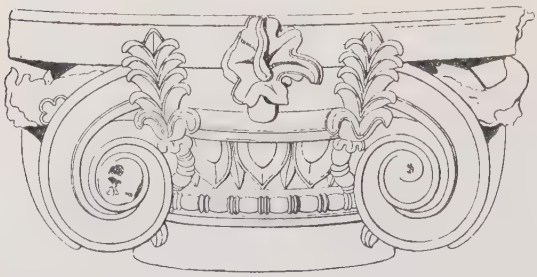
Of provincial basilicas, that at Pompeii shows the simpler type adopted, consisting of a central area enclosed by a single aisle. The columns, three feet six inches in diameter, are built

* Possibly because it was at one time assumed to have been the temple built by Vespasian

† The columns of the Christian basilica of St. Paolo fuori le Mura, destroyed by fire in 1823, were at one time supposed to have been taken from this basilica, but during the late excavations portions of these columns have been found on the site.

187. VIEW OF THE THREE GREAT HALLS FORMING THE SIDE AISLES OF THE BASILICA OF CONSTANTINE AT ROME.

of brick, each horizontal course consisting of nineteen bricks radiating round a central core of rubble work, the flutings being added afterwards in stucco. The height of the columns was probably from thirty-two to thirty-three feet. On the aisle wall are engaged columns of the Ionic order (Ill. 188), two feet four inches in diameter, and about twenty feet high. At the farther end of the basilica was a rectangular recess, raised some four feet above the aisle and entered by steps on the east side. This served as the law court, and the columns in its front supported beams whose ends were let into the sides of the great columns, thus inclining us to think that the aisles were similarly roofed over at a low level, and that there was no gallery, except over the entrance porch, access to which may have been obtained by the staircase provided to reach the upper storey * of the portico round the Forum. The central area of the basilica was probably covered over by a horizontal ceiling carried by the great columns and lighted through clerestory openings above the aisle roof. As the rain may occasionally have beaten in, a drain round the interior at the base of the columns was provided to carry off the water. The basilica at Fano built and described by Vitruvius seems to have been lighted in a similar way, but above a gallery.



188.—IONIC CAPITAL OF AISLE IN THE BASILICA AT POMPEII.

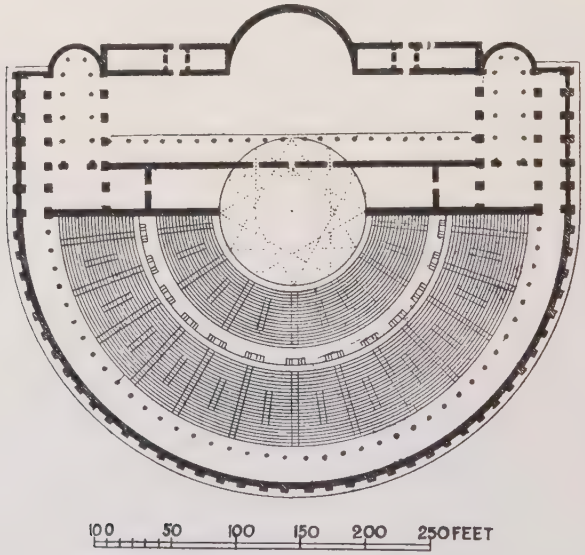
The Basilica at Treves is interesting in that it shows how the Romans designed their structures in accordance with the climate. Here the basilica was simply an immense hall lighted by two tiers of windows. The double tier suggests that originally there was a gallery round the interior, carried on columns.

* Of this upper storey the Ionic columns have been found, but no architraves; it is probable, therefore, that it was covered with a timber roof with projecting eaves.

Theatres.

The tendency in the later development of the Greek theatres was to bring the stage forward into the orchestra, so as to place the actors nearer to the spectators. In the Roman theatre the orchestra was reduced to a semicircle, on the diameter of which was the front of the stage. The greatest change, however, is found in the scaena, which was raised to a great height and decorated with great sumptuousness. The Greek theatre was generally excavated in the side of a hill, so that no substructure was required for the rising tiers of seats in the auditorium. The Romans occasionally availed themselves of similar opportunities, as found in the theatres of Asia Minor and Syria. In Rome, however, the introduction of vaulting enabled the Roman architect to build tier above tier of corridors, with staircases leading to the various parts of the theatre. These corridors, whilst serving as communication between the staircases, were probably used as refuges in case of heavy rain, and that is suggested by the fact that in most of the theatres excavated in the side of a hill there are great porticoes which might be used for that purpose. The outer corridors on the several tiers were lighted by open arcades, the walls between being decorated with columns of the Doric, Ionic, and Corinthian Orders, one above the other. That which was first designed and developed as a constructive feature became one of the finest architectural compositions it was possible to devise, and, coarse as are the mouldings of the Colosseum and incorrect the relative proportions of the orders, there is no more impressive monument in the world. The only example existing of a theatre in Rome is that of Marcellus (Ill. 189), already referred to (see p. 185). Unfortunately the two lower storeys only remain, the upper portion having been rebuilt for other purposes, and whether there was a third arcade or a blank wall with engaged Corinthian pilasters is not known. The substructures of the auditorium exist, and have been measured; but nothing remains of the scena, so that reference must be made to other examples to determine its structural and decorative treatment. The Theatre at Orange, sadly defective as regards its auditorium, still retains its scaena wall to its full height, and sufficient of the returns on either side to show that whilst in the Greek theatres there was a complete break between the scaena

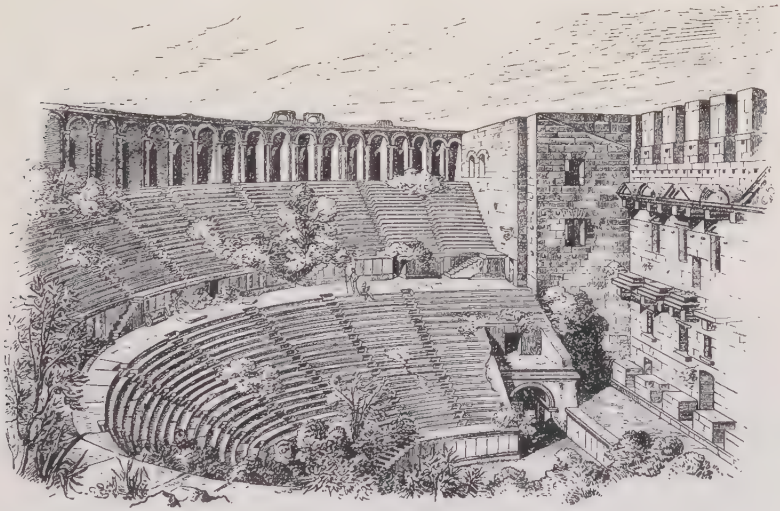
and the auditorium (so far as enclosure walls were concerned), in the Roman theatre the two were brought into one architectural whole. The total width of the theatre at Orange was three hundred and forty-three feet, inclusive of walls; the stage being two hundred and three feet wide, and forty-two feet deep. In the side wings next to the stage were staircases, and beyond these, on the right and left, halls about forty feet square, which seem on the ground and first floor to have been "foyers" for retreat in case of rain. In the rear of the stage, and running the whole width of the theatre, was an



189.—PLAN OF THE THEATRE OF MARCELLUS AT ROME.

immense portico for the same purpose. Vitruvius (v. 9) refers to these porticoes which should be built "behind the scenes, to which in case of sudden showers the people may retreat from the theatre"; they were also utilised for the rehearsals of the chorus. Throughout Asia Minor and Syria porticoes always formed essential adjuncts to every theatre. Protection from rain led to the carrying of a sloping roof, with ceiling under, over the whole stage. In the side walls of the Theatre at Orange are seen traces of the roof, and on the rear wall the sinkings in which the timbers rested. This roof consisted of ceiling beams rising from the back at

an angle of 30°, and forming cantilevers tied in by the rafters of the roof, and partly carried by projecting piers of the scaena wall as at Aspendus. In Caristie's* restoration the slanting ceiling is shown as enriched with coffers. Such a construction, two hundred and three feet long, could not have been self-supporting; at the back of the rear walls, therefore, and carried on corbels, were masts with iron chains attached to the upper timbers of the ceiling. The scaena wall exists to its original height, and the sinkings at various levels show that it was decorated with three storeys of niches flanked by



190.—THE THEATRE OF ASPENDUS.

marble columns and entablatures, and these were also carried on the two return walls of the stage. In order to understand the nature of these decorations it is necessary to examine other examples, and in Asia Minor there are some in which the lower storey of columns still remains. At Aizani, in Asia Minor, the scaena is more or less perfect; its plan is transitional between the Greek and Roman theatre, the auditorium being horseshoe in form, and there being no junction between the walls of the auditorium and the stage buildings. The depth of the stage was twenty feet, and the scaena, sixty feet in length, was decorated by a series of

* Caristie (A.), *Monuments à Orange*, 1856.

columns standing six feet from the wall and carrying a second storey of columns. These columns were arranged in pairs, with doorways between them, the central doorway being flanked by columns of greater size. The lower storey was of the Composite order, the upper Corinthian, and the covered portico seems to have been under the stage. In still better preservation (when visited by Fellows in 1841) was the Theatre of Aspendus (Ill. 190), also in Asia Minor, built by

191.—THE SMALLER THEATRE AT POMPEII.

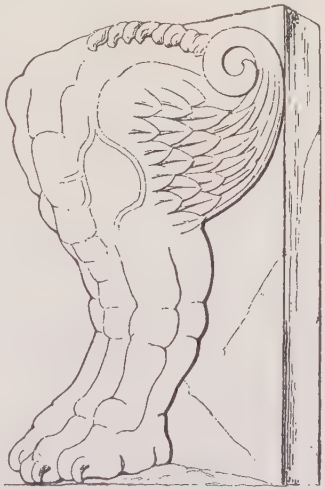
Zeno, the architect, in the reign of Antoninus Pius, 138—161 A.D. The illustration (No. 190) shows the auditorium with two ranges of seats, twenty-one in the lower and eighteen in the upper, with an arcaded gallery round, the only example existing except at Bosra, in Syria. The stage is similar to the one described at Orange, and the line of the roof of its ceiling is seen in the illustration, with the sinkings in the rear wall in which the rafters and ceiling beams were fixed. It also shows the decorations of the scaena, the columns only being missing. In a better known example at Taormina (Ill. 122, p. 142), some of the columns still remain, so that with these three examples

A. Soldiers' Barracks. B. Great Theatre. C. Smaller Theatre. D. Platform of Great Temple of Hercules. E. Triangular Forum. F. Great Forum. G. Building of Eumachius.

192. VIEW OF PART OF THE REMAINS OF POMPEII FROM THE SOUTH (FROM A MODEL).

the exterior of the Theatre of Marcellus, and the upper storey of the Colosseum, it is possible to arrive at a complete conjectural restoration of the Roman theatre.

Of other well-known examples, the Odeion of Herodes Atticus (166 A.D.), at the foot of the Acropolis, and, like the Theatre of Dionysus, partly hewn out of the rock, still preserves portions of its outer walls and some of the marble casing of the seats. The roof is stated to have been of cedar wood. This, however, can only refer to that over the stage, which may have resembled those at Orange and Aspendus, to which we have already referred. Without internal supports, of which there is no evidence, it is impossible that the Romans could have covered over the entire area, which had a diameter of two hundred and forty feet.



193.—GRIFFIN'S LEG FROM THE THEATRE AT POMPEII.

There were two theatres in Pompeii, both of them partially excavated in the rock. In the large theatre (Ill. 192) the stage, owing probably to its comparatively small size, is not brought forward as in most Roman theatres, and the seats are carried in parallel lines beyond the diameter of the orchestra. In the smaller theatre (Ill. 191) nearly all the seats are perfect; in those of the upper rows the irregularities of the cut rock are made good by fixing slabs of tufa seven inches thick and one foot wide to serve as seats. In both theatres are raised platforms, close to the stage, called tribunals, occupied by the provider or censor of the play. The parapet wall which separates the tribunals from the cavea or ordinary range of seats on each side of the theatre is terminated by a kneeling figure of Atlas, and at a lower level the favourite device of the winged hind leg of a griffin (Ill. 193).

Many other examples of theatres exist in Asia Minor, of which the chief, after Aspendus, already referred to, are Aizani (external diameter three hundred and eighty feet,

stage one hundred and fifty-six feet, with six pairs of Ionic columns decorating the scaena); Side (external diameter four hundred and nine feet); Telmessus; Alinda; Aegae; and in Syria those at Amman (external diameter four hundred and twenty-eight feet, with forty-three rows of seats); Gerasa, where the scaena still remains complete; Shuhba (external walls perfect); and Beisan, said to be the best-preserved in Palestine. Some of the above are published in Fellows's, Texier's and Lebas's works, but are now in many cases almost entirely destroyed.

Amphitheatres.

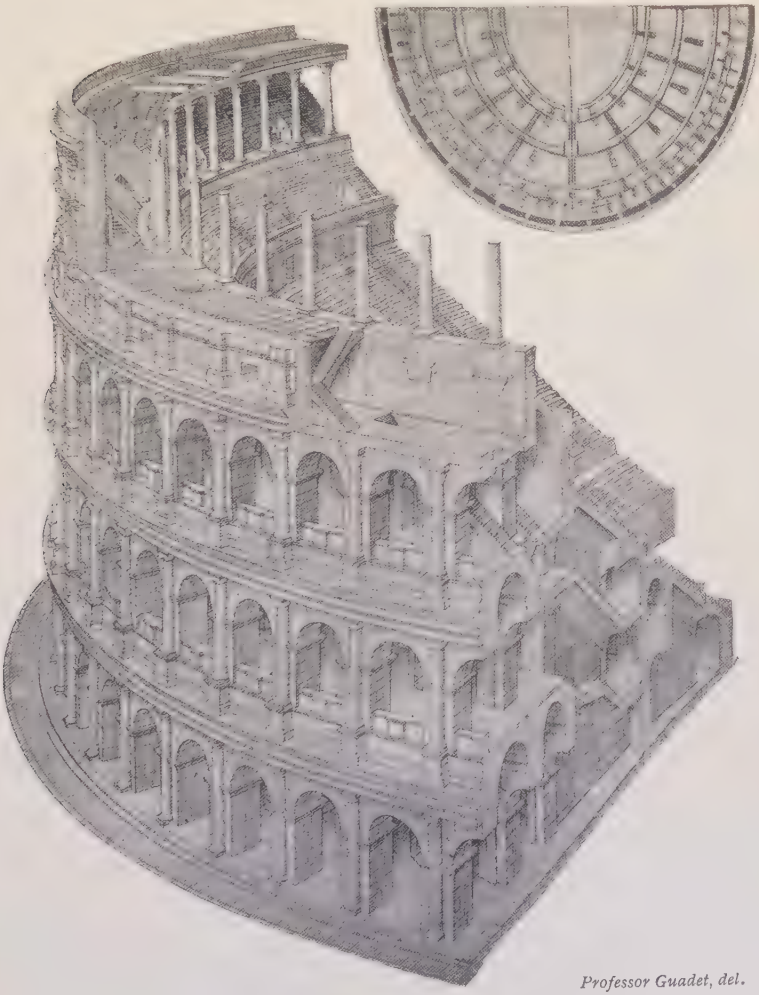
It was thought at one time that the Romans derived their amphitheatres from the Etruscans, but the example at Sutri, where the seats, corridors and arena are all cut in the solid rock, is now considered to be of later date than the Colosseum. Again, it has been suggested that the temporary wooden theatres of Curio, 50 B.C., gave the original model. Curio's amphitheatre consisted, according to the description given by Pliny, of two large theatres built in wood and made to run on wheels working round on a central pivot (hence the name), so that whilst the two theatres in the morning were used for dramatic representations, in the afternoon they were turned round to constitute an amphitheatre. If that had been so, the earliest amphitheatre would have consisted of two semicircular ends with a rectangular portion between them. This is, however, not the case. The earliest example known, the amphitheatre at Pompeii, which may possibly date from the commencement of the second century B.C., is elliptical. The arena there would seem to have been excavated, so as to save the expense of a lofty enclosure round the seats. The dimensions were four hundred and forty-five feet the major axis, and three hundred and forty-one feet the minor axis—an immense size for a second or third rate provincial town.

The largest amphitheatre* is that known as the Colosseum (Ills. 194, 195) (built on the site of Nero's Lake), commenced by Vespasian in 72 A.D., continued by Titus, inaugurated in 82 A.D. by Domitian, and completed with its topmost storey in 222—244 A.D. by Alexander Severus and Gordianus III. The

* The amphitheatre of Pozzuoli was ten feet longer but thirty-five feet narrower.

194. THE COLOSSEUM AT ROME.

building is elliptical in plan, and measures six hundred and twenty feet the longer axis, by five hundred and thirteen feet the shorter axis. It was raised on two steps in the middle



Professor Guadet, del.

195.—PLAN AND ISOMETRIC VIEW OF THE COLOSSEUM AT ROME.

of a great esplanade paved with travertine, the pavement of the corridors up to the inner corridor sloping outward, to allow any rain which might beat in to run out. Of the eighty entrances, two of which were reserved for the Emperor and his

suite, seventy-six were numbered and gave access to all parts of the cavea. The cavea was divided into four ranges of marble seats, corresponding nearly in level with the storeys of the exterior, the two lower ranges being separated by a passage (Diazoma), the third from the second by a wall and balustrade, and the upper range by the columns of the covered peristyle. Access to the various seats was given by staircases built between walls radiating to the arena corridors under the cavea, by passages between the ranges of seats, and by steps below the seats, the latter being divided into wedges (cunei). In the two lower ranges the staircases radiate to the arena; in the two upper they are parallel to the outer wall. Generally the lowest range of seats were occupied by the more distinguished citizens; the second by the middle class; the third by the poor; and the peristyle by women. The whole of the exterior and the principal corridors were built in travertine stone in large blocks carefully jointed, set without mortar, and secured with iron clamps run in with lead; the inner walls were built of tufa and concrete, with brick facing; and all corridors, staircases and substructures carrying the marble seats were vaulted in concrete. The two principal entrances, one on each side, were reserved for the Emperor and his court, ministers and foreign ambassadors, and led to a platform (Pulviar) raised above the other seats and protected by a wall on each side. The arena measured two hundred and eighty-seven feet by one hundred and eighty feet, and was surrounded by a wall fifteen feet high, with iron grille and other protection on the top. The excavations undertaken by the French in 1811—13, revealed the existence of numerous passages round the centre communicating with the dens in which the wild beasts were shut up; putlog holes exist in the walls of the passages under the arena in which joists carrying a series of inclined planes were provided leading from the dens to the arena level. Similar underground arrangements had long been known at Capua and other amphitheatres.

The exterior is divided into four storeys, the three lower ones being pierced with a series of arches of equal dimensions, forming, as it were, a continuous arcade round the building, and divided by three-quarter-detached columns of the Tuscan,*

* There are no triglyphs in the frieze of the lower order, the capitals have Etruscan mouldings, and the bases are Etruscan.

Ionic, and Corinthian Orders, superposed on the respective storeys, and carrying each a complete entablature, the architraves of which are voussoired and carried back into the solid wall. The upper storey is unpierced except by small windows lighting the corridor underneath the upper range of seats or gallery, and its wall is decorated with Corinthian pilasters on lofty pedestals superposed on the other orders below. Above the windows are three projecting corbels in each bay to carry the masts of the velarium, which rise through the cornice. The proportion of the lowest Order is poor and meagre, the column being 9 diameters high and $7\frac{1}{2}$ diameters centre to centre. In consequence of the height of the vault over the ground floor corridor, the pavement of the corridor above is raised considerably above the cornice of the Order, and a podium or plinth is introduced, the cornice of which ranges with the first floor pavement; a similar arrangement exists on the next floor. Under the columns the mouldings of the plinth return on each side, and constitute pedestals, and it may be in consequence of this arrangement that the Ionic column is only eight and a half diameters in height, as also the Corinthian column above. The results are very fine, and compensate for the poorness of the ground storey. In order to afford protection to the first and second floor corridors solid balustrades are carried within the imposts of the arcades.

The complete entablature of each order is carried round without a break, and this and the sturdy nature of the three-quarter-detached columns give a monumental effect to the Colosseum which it would be impossible to rival. The applied decoration of the orders, their superposition, and the jointing of the architraves, in principle are all wrong, and should be condemned; but the portions of the external wall which remain, rising to their full height of one hundred and fifty-seven feet, and the splendid nature of the masonry, disarm all criticism and constitute the Colosseum as one of the most sublime efforts of Roman architecture.

It has never been quite determined whether the velarium, the stretching of which was done by sailors who were placed on the roof of the peristyle gallery round, extended over the whole or part only of the interior, and whether, when stretched, its centre was the highest, or lowest part.

A second example in Rome, the Castrense Amphitheatre, was

built by Septimius Severus or Caracalla for the soldiers of the Prætorian camp. It was built of concrete and faced with brick, with brick pilasters and Corinthian capitals in moulded terra-cotta built in courses ranging with the bricks. Originally there were three storeys, the two lower ones with arcades, as shown in a drawing by Palladio in the Burlington-Devonshire Collection.

The other amphitheatres of importance, taken in order of dimension, were those of Capua, Verona, El Djem, Pola, Arles,

196.—THE AMPHITHEATRE AT VERONA.

Nismes, and Pompeii. The amphitheatre at Verona (Ill. 196) has preserved nearly the whole of its stone seats, but retains only four bays of its external walls. In the example at Pola, on the other hand, the external walls exist, but the seats have all gone, possibly because they were constructed of wood. In both these cases the masonry is rusticated, with flat pilasters only between the arcades, so that the superposed orders are not sufficiently emphasised and the general effect is poor. In the amphitheatre at Pola there are, on the diagonal axes, four projecting bays, forty-three feet wide and ten feet projection, forming on the

ground storey open arcades, and containing staircases in the two upper storeys.

In the amphitheatre at Nismes there were only two storeys and an attic which supported the masts for the velarium. The lower storey has three-quarter-detached piers, and above three-quarter-detached columns of the Doric Order. The floor of the first storey arcade was level with the cornice, and the mouldings of the entablature on both storeys break round the pilasters and columns. The arch of the arcade of the upper storey is carried as a barrel vault across the corridor, which has a fine external effect, but destroys the continuity of the corridor.

The amphitheatre of El Djem (Thysdrus), south of Carthage in North Africa, ranks next in size to the example at Verona, and was evidently built in imitation of the Colosseum, though it differs from it in the orders employed for the three arcaded storeys, the first and the third storey being decorated with Corinthian columns, and the second storey with those of the Composite order. The intercolumniation, $9\frac{1}{2}$ diameters, is so wide that it scarcely carries out the principles of the Roman order as already described, and the columns being semi-detached only, have not the vigour and boldness of the Colosseum design. On the other hand, the masonry is of great excellence. The stones were obtained from a quarry twenty miles distant, and all the courses are, according to Mr. Graham, of the same height, viz., twenty inches. The building was erected by the Emperor Gordianus III., but was never completed. There were sixty-four arches, and the three storeys rose to a height of eighty-five feet. The fourth or attic storey required to carry the velarium was commenced on the inner wall of the external gallery, but never terminated.

The Stadium.

In imitation probably of the Greek stadium, Domitian built an example in the Campus Martius, of which one of the piers was lately discovered in the Piazza Navona, which now occupies its site. He also commenced a second stadium, which was afterwards completed by Hadrian and his successors, in a valley between the Palaces of Augustus and Severus (see J, Ill. 233, p. 288). It differed from the Greek stadium in that under the

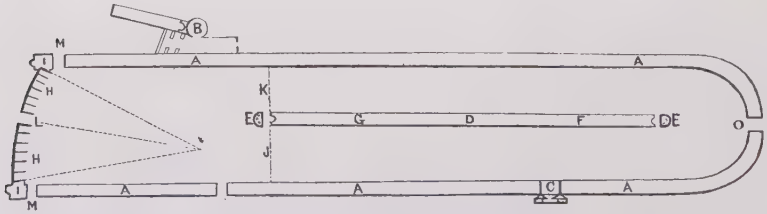
ranges of seats was an arcade twenty-two feet wide in two storeys, with superposed columns of the Corinthian Order. It was built in concrete encased in brick, and faced with white marble, the columns, capitals and the entablature being in solid blocks.

The Roman Circus.

There are scarcely any remains of the Circus Maximus, built in the valley between the Palatine and Aventine Hills, and dominated by the Palaces of the Caesars on the north side; the site was already used for fêtes in the earliest days of Rome, and Tarquin was the first to level the valley. His son erected an arcade round, with shops, and ranges of seats above in timber. Frequent fires destroyed the latter, and it was reserved for Trajan to rebuild the seats in stone covered with marble. The area measured two thousand two hundred feet in length by seven hundred and five feet in width, and could hold three hundred and eighty thousand spectators.

The Circus of Nero, built by Elagabalus, 220 A.D., was destroyed by Constantine in the fourth century.

Of the Circus of Romulus, built by Maxentius 311 A.D. (Ill. 197), there still exist sufficient remains to determine the plan, the arrangement of the seats, the spina, carceres, and the Emperor's tribune. The area covered was one thousand six hundred and twenty feet long by two hundred and forty-five feet wide, and the spina was one thousand feet in length.



197.—PLAN OF THE CIRCUS OF ROMULUS.

A, A, seats (cavea); B, probably the pulvinar or station of the Emperor; C, seat for a person of distinction; D, spina; E, E, metae or goals; F, ova; G, delphinae; H, H, stalls for horses and chariots (carceres); I, I, two towers; J, starting line of race; K, goal line of return; L, entrance of procession; M, N, O, other entrances and exits.

CHAPTER XIII.

THE THERMAE OR IMPERIAL BATHS.

THE term Thermae is given to those immense bathing establishments built by the Emperors in order to ingratiate themselves with the people.* They were devoted not only to baths, which were of exceptional size and magnificence, but to every kind of gymnastic pursuit—wrestling, boxing, racing, jumping, etc.—to the training in the same for both youths and athletes, and to various games. Beyond this, the Thermae were the resort of the poets, philosophers and statesmen, who in the hemicycle and other halls held forth and made known that which in our day is printed in the daily newspapers or in books. Here, also, poets and authors could read in public their latest works.

There has always been some difficulty in assigning the right names and purposes to the several halls, principally owing to the fact that, although baths are frequently mentioned in ancient authors, no adequate description has been given of the various processes which had to be gone through when taking a bath, or of the other purposes of the Thermae. One of the best illustrated works on the subject is that of the Thermae of Caracalla, by Abel Blouet, of the French Academy, published in 1828, and based on excavations made in 1824—1826. A later work by M. Paulin, 1890, on the Thermae of Diocletian, contains further information, and in his conjectural restoration suggests even greater magnificence than that shown in Blouet. The plans of the great Thermae were measured and drawn by Palladio about 1560, when the

* Of ordinary baths such as those found in Pompeii there are said to have been in Rome over eight hundred.

remains were far more extensive than at the present day. These plans were published by Lord Burlington in 1730, and by Cameron in 1772.

The principal value of the study of the plans of these Thermae, however, lies chiefly in the principles observed in the setting out, and in the aggregation of a number of halls together, of different dimensions and varied heights, a problem which at the present day has constantly to be solved, and from this point of view the actual purpose and use of each hall is of minor importance.

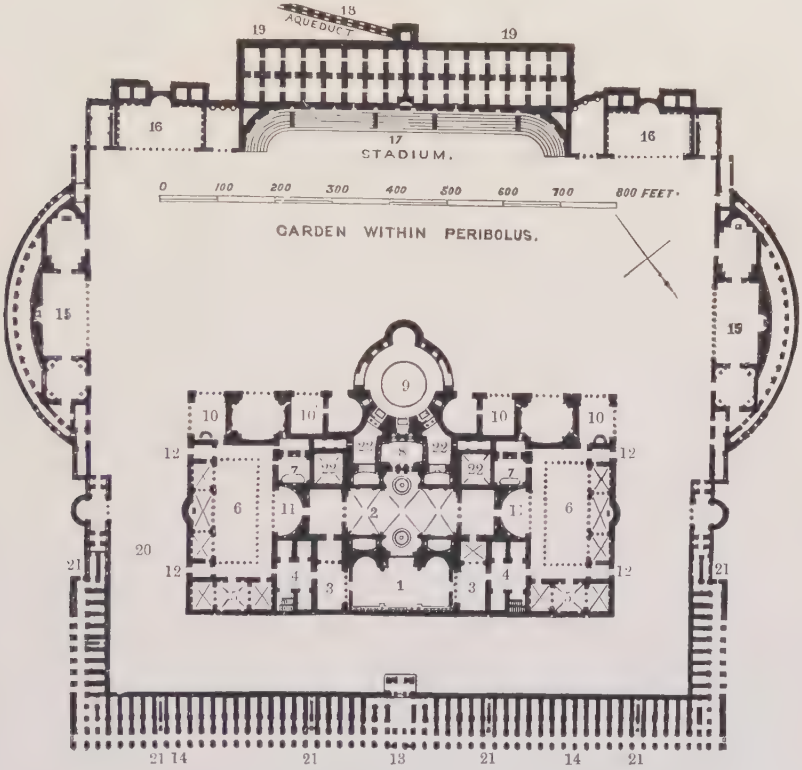
The earliest Thermae were those built by Agrippa about 20 B.C. in the Campus Martius, about two hundred feet south of the first Pantheon. They were restored and added to chiefly by Hadrian and Severus, and were preserved more or less complete till the sixteenth century. Of other examples sufficient remains have been found of those of Titus (79—81 A.D.), Domitian (81—96 A.D.), Trajan (98—118 A.D.), Caracalla (211—217 A.D.), Diocletian (284—304 A.D.), and Constantine (306—337 A.D.) to enable fairly accurate conjectural restorations to be made of them. The most complete is that of Caracalla, whilst of Diocletian's Thermae two of the great halls still exist in the Church of S. Maria degli Angeli, and others are now occupied by the National Museum. Recent excavations of the Baths of Titus have also revealed many features previously unknown (see Ill. 202, p. 251).

Although in detail the plans of the several Thermae vary, they are all set out on the same principle, and as this is best illustrated in those of Caracalla, its plan may be taken first. Attention has been already drawn, when speaking of the Forums, to the maintenance of the axis in the scheming out of the plan. This is found in all the monumental work of the Romans, and can even be followed in the smaller houses at Pompeii. A second principle is the establishment of some central important feature, and the subordination of all the other parts to it. In the Thermae the *Tepidarium, or central hall, constituted the nucleus which governed the plan and around which all the other halls and rooms were grouped.*

The main block of the Thermae of Caracalla (Ill. 198)* has an area of about two hundred and seventy thousand square feet—

* Reproduced from Dr. Middleton's *Remains of Ancient Rome*, by permission of the publishers (Messrs. A. and C. Black).

greater than either the Houses of Parliament, the Law Courts, or the British Museum. The Tepidarium, or central hall (No. 2



198 —PLAN OF THE THERMAE OF CARACALLA AT ROME.

REFERENCES.

1. Frigidarium.
2. Tepidarium.
3. Halls.
4. Apodyterium.
5. Ditto.
6. Peristyle Halls.
7. Hot Baths.
8. Antechamber or Laconicum.
9 Calidarium.
10 Special Baths for Athletes.
11. Hemicycles.
12. Entrance to Baths.
13. Principal Entrance of the Thermae.
14. Private Baths.
15. Lecture Rooms, Libraries, and Porticoes for Promenading.
16. Palestrae.
17. The Stadium.
18. The Marcian Aqueduct.
19. Reservoirs.
20. Ancient House discovered on Site.
21. Staircases to Private Baths.
22. Internal Courts.

on plan), measures one hundred and eighty-three feet by seventy-nine feet in the clear between the brick walls. It was covered with an intersecting barrel vault, the soffit of which

was one hundred and eight feet above the pavement of the hall. The hall was divided into three bays, and in order to resist the thrust of the vault on the four central piers,* walls fourteen to sixteen feet wide and fifty-four feet deep were provided on the north side, and extended on the south side to eighty feet in depth by arches thrown across the ante-chamber to the Calidarium. The spaces between these walls, on both sides of the Tepidarium, were utilised for tepid baths, and on the side of the Frigidarium were developed into large semi-circular recesses which constituted very important architectural features. On each side of the Frigidarium, and separated from it by a peristyle of columns, were halls for the spectators of the sports in the cold bath; and again, beyond these, on right and left, were other rooms, some on two floors, which were used either for dressing rooms (apodyteria), or for the oiling and sanding of the body. Looking at the comparative importance of a similar room at Pompeii, the entrance and side rooms in this plan would serve better the purpose of the apodyterium than that of a library as suggested by Blouet. At the end of the Tepidarium were great halls separated from it by a screen of columns, so that from one end to the other there was a vista of three hundred and thirteen feet. Beyond these were *hemicycles* (11), semicircular halls of considerable height, corresponding to those set apart as law courts in the basilicas, and here assigned to the philosophers and poets. On the south side of the Tepidarium was an ante-chamber to the Calidarium, with two baths in it, and possibly of a lower temperature than the latter. The Calidarium (9) was a large circular hall covered with a dome. In the centre was a circular bath.

The four other rooms (10) on each side of the Calidarium, facing the xystus or garden, were probably used by those who were engaged in the various exercises there. There is one hall on each side which had no bath in it, and may have been used for games at ball. We have still to note the open courts (6) on the right and left of the block, with porticoes round them, for promenading; and the halls beyond, called *ephebia*, which were used for the training of youths. This completes the main block of the Thermae of Caracalla.

* The thrust at the four angles was amply resisted by walls on the right and left, one hundred and eight feet long, and in the front and rear eighty feet and fifty-four feet respectively.

When we come to compare it with other examples, the theory we have put forward relative to the Tepidarium constituting the nucleus round which all the other services were grouped will become more evident. For the moment we pass on to the immense enclosure in which the block of buildings above described was situated, the entrance to which was on the north-east side. Outside this enclosure was a portico giving access to a series of private or what we should call "slipper" baths (14). These were carried along the whole front and the return ends; of these private baths there was an upper storey, reached by staircases (21).

Passing through the entrance gate (13), between the walls of these private baths and the central block was a promenade one hundred and thirty-one feet wide, which was laid out with alleys of trees. This left an open space at the further end of the site, of about four hundred feet in depth and one thousand one hundred feet long, in which the exercises and games took place. At the farther end of the enclosure, and in front of the series of reservoirs (19) (in two storeys, supplied by the Marcian aqueduct) was the Stadium (17), where the racing and athletic contests took place. The two halls (16) in the centre of each side were palaestrae, or exercise rooms, the rooms adjoining being for those taking part in the contests and for service.

To the right and left of the enclosure were projections with semicircular porticoes, used by the poets and authors as promenades. In the central halls in front of these (15) they recited their poems or speeches, and the other halls on either side may have been libraries; their purpose being for us of less importance than their disposition.

Returning again to the central block; the Tepidarium (Ill. 199), rising much higher than the adjoining halls, was lighted by clerestory windows above their roofs, and this is generally the case with every group of halls—the central hall always rising higher than the side ones (Ills. 204, 205) (even when in the latter there are two storeys), and obtaining its light by clerestory windows. It was always supposed that the Frigidarium was open to the sky, but the discovery of many tons of L or T-shaped iron below the pavement of the bath, bolted together in the form of a St. Andrew's cross, has raised the question as to whether it was not partially covered over by iron girders encased in bronze, answering to the description of Aelius

Spartianus (297 A.D.), who, referring to the solar cells (cella soliaris) says, "Cross beams of brass or copper are said to have been placed on the top, to which the whole ceiling was

From a drawing by R. Phené Spiers.

199.—RESTORED INTERIOR OF THE TEPIDARIUM OF THE THERMAE OF CARACALLA.

entrusted, and so great is the span as to make learned mechanicians say that this very construction is impossible." Dr. Middleton says, speaking of the Frigidarium of the Thermae of Caracalla, "In the upper part of the walls deep sinkings to

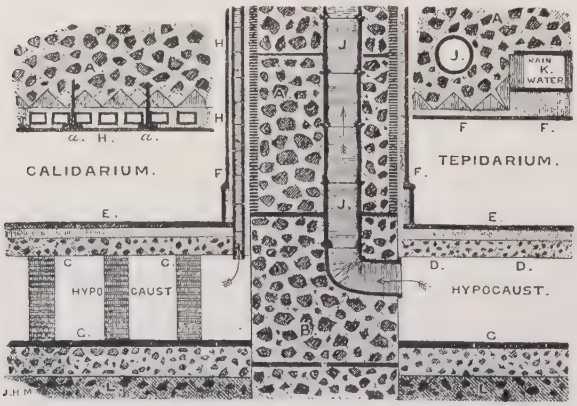
receive the ends of the great girders which supported the ceiling are clearly visible." As, however, the span was sixty-eight feet between the great columns on each side, and seventy-six feet between the buttress piers of the Tepidarium and the north-east wall of the Frigidarium, it is at present difficult to understand how the girders were carried without intermediate supports.

Before passing to the other Thermae there are two important points which still require some description, viz., the service of the Thermae and their heating. In order to follow the first, it should be noted that the whole of the Thermae of Caracalla, including the enclosures, were raised on an artificial platform twenty feet high.* The private baths to which reference has been made as existing on the main front, and returning some three hundred and seventy feet along the two sides, were in two storeys, the lower storey on the level of the street, the upper on the level of the platform. In the centre of the open space between the main entrance and the central block was a triple service corridor (see Blouet), fifty-eight feet wide, which was lighted and ventilated by circular openings at the top, these probably covered over by bronze gratings. Similar vaulted corridors were carried on each side of the central block to the further end of the enclosure, with cross corridors to the open courts and other halls where service was required in the central block. These and vaulted chambers for stores of various kinds occupied a considerable portion of the artificial platform.

The hypocausts of the Thermae of Caracalla are shown in a drawing reproduced from Dr. Middleton's work on Rome (Ill. 200). From three to four feet below the pavement of the baths, on a bed of concrete, were laid the ordinary Roman tiles (two feet square and averaging one and three-quarter inch thick). On this floor were built small piers, two feet high, of smaller tiles, eight inches square. These piers carried a concrete floor about twelve inches in thickness, on which was floated first a layer of pounded tufa and potsherds, and then a thin course of marble cement in which the mosaics were embedded or on which marble slabs were laid (E). The furnaces, stoked and

* In one instance, on the left of the central block, a chance discovery revealed the remains of a house (20, Ill. 198)—which showed that the site was then already occupied, probably with houses of an inferior class only—which were thrown down and formed part of the substructure of the platform.

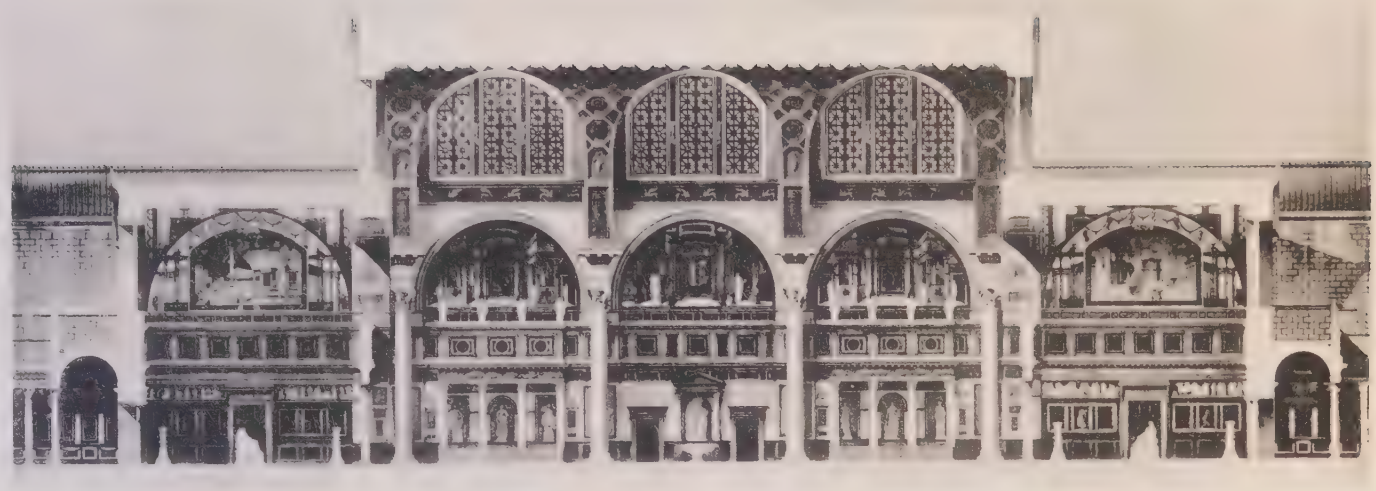
lighted from the inner courts (22, Ill. 198), were at a lower level than the hypocaust floor, and the smoke and heated air passed under the floor to flues in the walls on the farther side of the several halls. The flues consisted of socket-jointed clay pipes, about twelve inches in diameter. For the halls which required an exceptional heat the walls were virtually lined with these flue pipes (H H). In rooms of smaller size the tile piers were sometimes dispensed with altogether, the whole of the concrete floor resting on ledges or corbels in the wall (D D). Dr. Middleton gives one instance in the house of the Vestals where there is a concrete floor fourteen inches thick with a bearing of twenty feet. In this as in all the other cases we must assume that these floors were filled-in on some temporary support of wood planking.



200.—PLAN AND SECTION OF THE HYPOCAUST OF THE THERMAE OF CARACALLA.

The Thermae of Diocletian (290 A.D.) resemble very closely those of Caracalla, the principal differences being, (I.) instead of the hall and hemicycle on the right and left of the Tepidarium there are two halls of equal size; (II.) the antechamber to the Calidarium is circular, with a circular opening at the top, which suggests that it formed the laconicum described by Vitruvius (v. 10); (III.) the Calidarium is a hall of the same plan as the Tepidarium, with hot baths between the buttresses; (IV.) the Frigidarium is two bays wider; (V.) the entrance to the baths is on the chief front at each end, and consists of a large vestibule leading to the apodyterium; and (VI.) the oiling and sanding rooms are placed on each side, at the farthest end of the building.

In the Thermae of Titus (Ills. 201, 202) the late excavations have shown that the Frigidarium was much larger

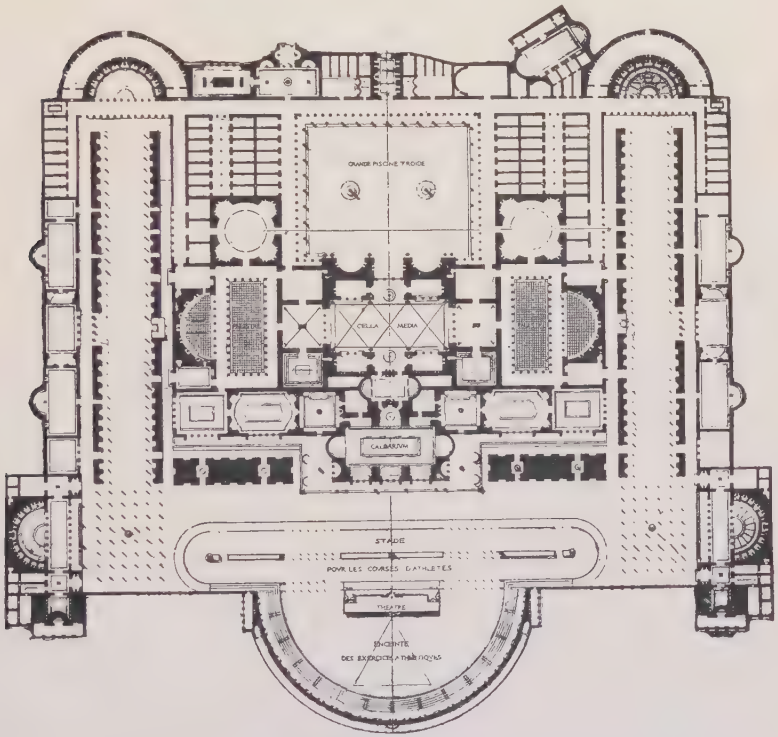


Scale ½ inch to 10 feet.

201. SECTION THROUGH THE CENTRAL HALL OF THE THERMAE OF TITUS.

As Restored by M Charles A. Leclerc.

than that of Caracalla, and was enclosed with a peristyle on three sides. The Tepidarium and halls on the south-west side are similar to those of the Thermae of Diocletian. The vaulted hemicycles (the earliest examples known) are placed on the extreme right and left of the central block, beyond the peristyle court. In front of the central block, on each side, is a circular room, with a bath in the centre similar to that described in the



202.—PLAN OF THE THERMAE OF TITUS, RESTORED BY M. LECLERC.

Baths at Pompeii as the Frigidarium, and on the right and left of the latter are the private baths. The enclosure in which the main block is built is not so large as in the Thermae of Caracalla. Passing through the entrance gateway, we enter the north peristyle of the Frigidarium, and the corridor is carried to the right and left, affording covered access—to various halls, to two great hemicycles with circular promenades in the rear, and to other private baths. On each side of the central block there were wide promenades planted with bosquets, with exedrae or

semicircular marble seats and avenue of trees. The Stadium, at the farther end (built over part of the Golden House of Nero), was semicircular. In this case, as also in the Thermae of Constantine, on the right and left of the enclosure were a series of halls and two other hemicycles.

Of the Thermae of Agrippa, B.C. 20, there are no remains existing, but the plan was measured and drawn by Palladio before their destruction, and is published in Cameron's *Baths of the Romans*, 1772. In Palladio's plan the Tepidarium is shown similar to those examples we have already referred to, except that it is placed at right angles to the main front. There seems, however, to be some discrepancy between it and the one given by Count Nispi-Landi,* who shows a circular hall in the middle of the Tepidarium, with actual remains of the walls of same. It does seem strange that at this early period a hall one hundred and sixty-five feet long by eighty-three feet wide, vaulted with an intersecting barrel vault, should have been conceived. A central domed hall (about seventy-five feet in diameter), as shown on Count Nispi-Landi's plan, might have been covered with a conical vault like the laconicum† in the Stabian baths at Pompeii, which is probably of much earlier date. In other respects the plan is similar to those already described. At a later period Hadrian built, between the Thermae of Agrippa and the Pantheon, an immense rectangular hall adjoining the latter, which may have been the Calidarium, and Septimius Severus afterwards added largely to the Thermae on the south side and built a laconicum in the centre, portions of which still exist in the so-called Arco di Giambella. In a fragment of the marble plan‡ found in 1901, this circular hall is shown with other rooms, and the inscription

underneath. Another plan of this portion of the Thermae is published in the Baron de Geymuller's work.§

* Nispi-Landi (Count), *Marco Agrippa e i suoi tempi: le terme e il Panteon*. Rome, 1883.

† Dion Cassius, an historian of the latter part of the second century A.D., says (liii. 27), "During this time Agrippa adorned the city at his own expense: in memory of his naval victories he built the porticus known as that of Neptune; he constructed the *hot-bath chamber, which he called the Laconicum gymnasium*." "He also finished the temple called the Pantheon." These statements would seem to confirm Count Nispi-Landi's plan.

‡ See note, page 157.

§ *Documents inédits sur les Thermes d'Agrippa, le Panthéon et les Thermes de Dioclétien*. 4to, Lausanne, 1883.

Among the other Thermae, in those of Domitian and Constantine the Tepidarium constitutes the principal hall round which the other services are grouped, the longitudinal and transverse axes of the Tepidarium being the leading lines of the setting out in all cases. In the Thermae of Trajan the Tepidarium takes the form of a cross with an intersecting barrel vault.

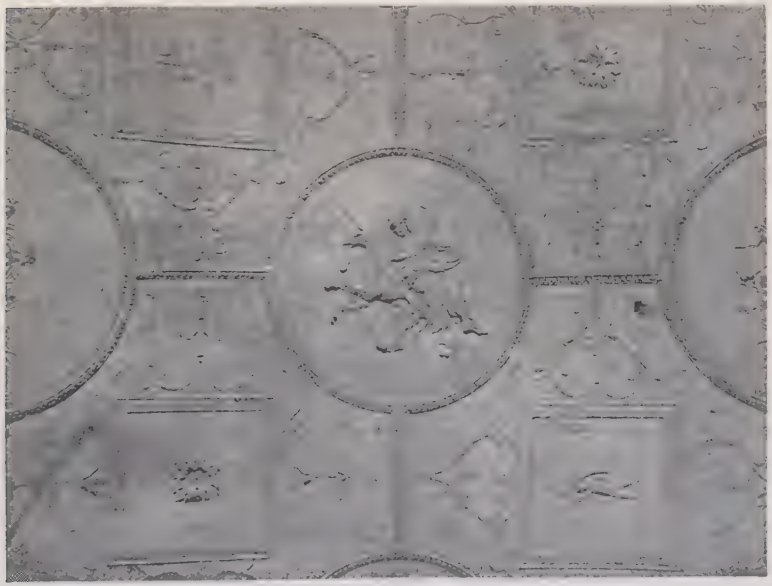
The architectural decoration of the Thermae in its nature and in the principles of its design seems to have been so similar in all the examples quoted that no separate description of each is required. Palladio seems to have confined his attention to the main forms of the structure, including only the columns which formed essential constructional features, so that all appear to be the same in the series of elevations and sections given. There is no doubt that in many cases Palladio's sections are purely conjectural, and indicate only a type of vaulting which he conceived likely to have been adopted when comparing them with other plans of similar design. It was reserved, therefore, for the students of the French Academy to publish in two important works the most complete sets of drawings of two of the Thermae, already referred to, showing the actual remains existing and conjectural restorations, which not only corroborate one another so far as the decoration of the Thermae is concerned, but suggest the type which was adopted in all the Roman Palaces. M. Paulin has been able to carry his conjectural restoration further in some cases than Blouet, because, *1stly*, in the Church of St. Maria degli Angeli, in the Ospedale Marguerite (now the National Museum), and in the Church of St. Bernardo, are preserved some of the halls of the Thermae of Diocletian, retaining still their vaults, and on their external walls part of the marble decorations; *2ndly*, the systematic exploration of the last thirty-five years throughout Rome has revealed important evidence as regards the construction and decoration of every class of building; and *3rdly*, drawings by various artists have been discovered in the Uffizi Galleries in Florence and in the various libraries of Rome which show the actual condition of the buildings from the fifteenth century onwards.

The remains found of the Thermae of Caracalla (immense masses of brickwork and concrete) used to be looked upon as a proof that the carcase of the structure was built first by the architect or engineer, and the various marble linings, columns, etc., were supplied and fixed afterwards by the decorative

artist. This, however, was not the case, for (as has already been insisted on with reference to the Pantheon, p. 223) the principal decorative features of the interior, viz., the columns in front of the chapels, are parts of the integral structure of the building. The same condition holds good with reference to the great Thermae, for there are only one or two exceptional instances in which the removal of the columns has not resulted in the ruin of the structure. Owing to the cohesive nature of the pozzolana concrete, the removal of the great columns which were supposed to have assisted in carrying the vault of the Basilica of Constantine has been accomplished without causing projecting portions of the vault also to fall, but this is exceptional. As a rule all the larger columns carried floors or vaults, and their removal has been fatal. So with regard to the decoration of the principal halls and courts: the series of two or three tiers of niches, flanked by marble columns carried on corbels and supporting entablature and pediment, were securely fixed to the wall by these corbels and by the entablature blocks built into the wall. These solid blocks of marble being sunk two feet into the wall, must have been built-in whilst the carcase was being constructed. Owing to their height, many of these marble blocks have escaped the plunderer, and some still exist in the outer walls of the Church of St. Maria degli Angeli. Again, all the niches were regularly constructed in brick of the required depth. These facts prove that the whole design was conceived by the architect prior to the commencement of the work, and that as soon as the plan was set-out, it ruled the whole of the structure both constructively and decoratively.

For this reason it is not necessary to describe each set of Thermae separately, nor is any lengthy account required. The columns employed throughout the Thermae were generally of marble, as also their entablatures; the shafts of the same, whether large or small, were all monoliths, and of various kinds. The great shafts of the Tepidarium of Caracalla, thirty-eight feet high and five feet four inches in diameter, were in granite; others of smaller size were of porphyry, oriental alabaster, giallo antico, and numerous other marbles from the Greek islands. The larger columns supported the vaults or the floors of the balconies overlooking the Tepidarium, or formed screens between the halls; they likewise constituted the frontage to the halls round the xystus, or carried the roofs of the numerous peristyles, so that

they were all constructional features. The smaller columns of the niches and the whole of the marble facings were decorative, and were not fixed till after the completion of the carcase. The halls and courts were all paved with marble mosaic in diverse patterns, with figures of gladiators, athletes, tritons, and geometrical designs and borders. The steps, linings of baths, bases, exedra, capitals, entablature, etc., were all in white marble. The walls were lined with marble of various colours and panelled like those of the Pantheon, up to



203.—CEILING OF TOMB IN THE VIA LATINA AT ROME.

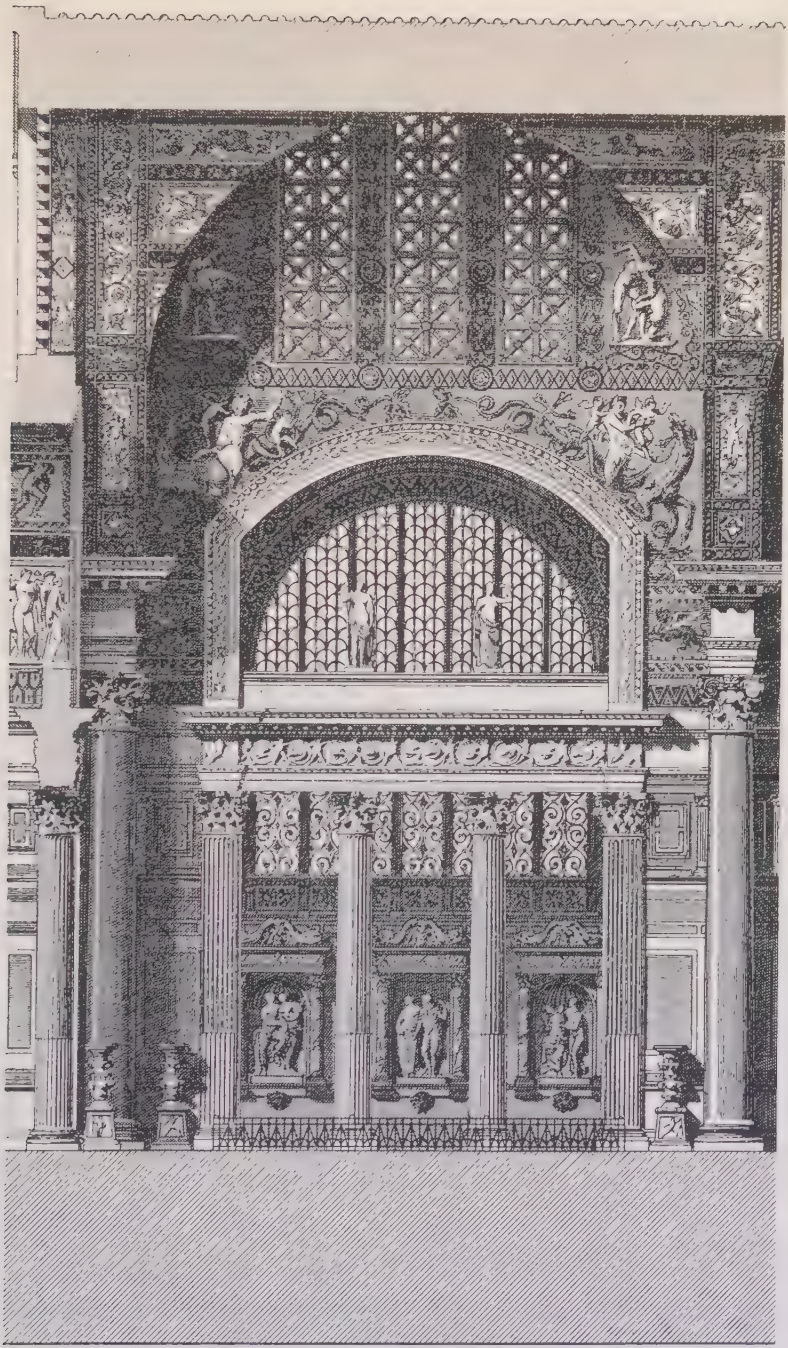
a certain height, and above that in white marble up to the springing of the vault. The upper portion of the walls and the vaults were decorated in stucco with arabesque ornament, similar to that found in the Roman tombs (Ill. 203). As in the larger vaults, such as those of the Tepidarium, the inner lining was already of tiles (for the constructive reasons given in Chapter IX.), it was not possible to have the deep coffers like those constructed in brick in the aisles of the Basilica of Constantine. The panels, in consequence, could not be of any depth, and were therefore filled with glass mosaic,

to accentuate the small figure subjects, which otherwise, at their great height, would not have been distinguishable. Blouet contents himself with reproductions of the panel subjects found in the Roman tombs and at Pompeii; whilst Paulin suggests large figure subjects in mosaic (Ills. 204 and 205*) for both walls and vaults. The walls enclosing the Frigidarium were decorated with tier above tier of niches, flanked by columns carrying entablatures and pediments, circular as well as triangular. The existence of these in the Thermae of Diocletian is shown by the niches sunk in the brick-work and by the marble corbels; Paulin's restoration is corroborated by the drawings of an Italian artist of about 1475 A.D. in the Uffizi Collection, Florence, published in the Baron de Geymuller's work. These represent not only the niches, but the actual decoration of the immense buttresses of the Tepidarium.†

Whilst in the interior of the Thermae the decorations in marble and mosaic were of the most elaborate and sumptuous character, the Romans do not appear to have attached the same value to the external appearance, and they contented themselves with covering the walls with the fine stucco we have already described in Chapter IX., which, from its resemblance to marble and its great durability, required only the imitation joints of stone to give it a certain monumental character. This is the type of wall surface which has been adhered to by Paulin in his conjectural restoration of the outer walls of the Thermae of Diocletian, and the same was probably adopted to protect and decorate the concrete walls faced with brick which, from the time of Augustus, became the favourite method of construction in Rome. Even the upper portion of the Pantheon and the pilasters decorating the upper storey were coated with stucco. A divergence from this custom has been pointed out by Blouet, who found the remains of stucco, three inches thick, inlaid with mosaics, which covered the upper portion of the front of the central block of the Thermae of Caracalla. Sufficient existed to show that the decoration

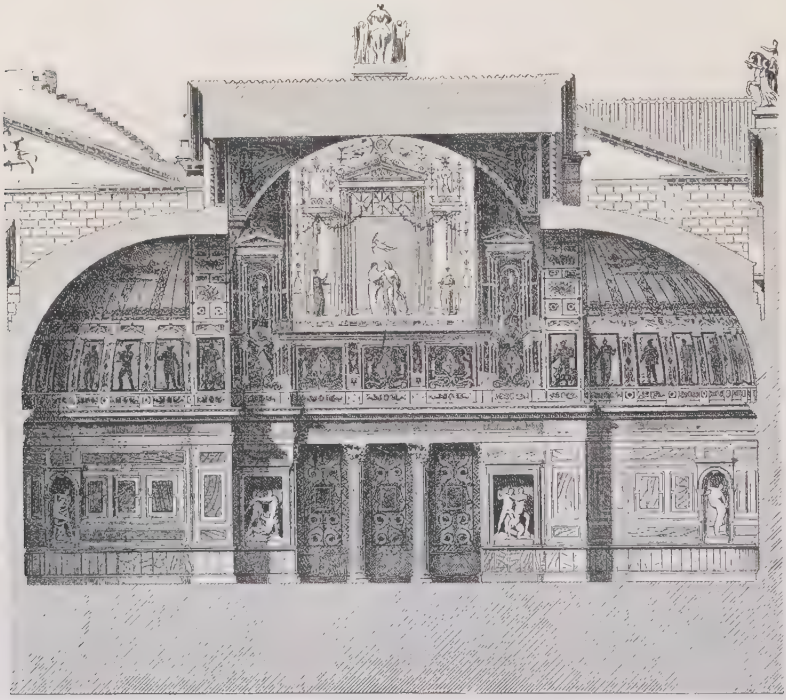
* Illustrations 204 and 205 are reproduced from M. Paulin's fine work, entitled *Les Thermes de Diocletian*, published by Firmin-Didot et Cie.

† A further corroboration of Paulin's restoration of these buttresses will be found in drawings by Palladio in the Burlington-Devonshire Collection, now in the R.I.B.A., with the exception of the crowning feature, which is shown as a solid buttress and without the canopy drawn by Paulin.



204. ONE BAY OF THE TEPIDARIUM OF THE THERMAE OF DIOCLETIAN AS RESTORED BY M. PAULIN.

adopted was that which was found in the Thermae of Titus, and is better known to us by the paintings in Pompeii, representing imaginary courts with porticoes and verandahs, such as may have been derived from the ephemeral decorations of the solaria or terrace roofs of the houses. This type of design is shown in the conjectural restoration by Blouet of the external wall of the central block facing the xystus, and in Paulin's



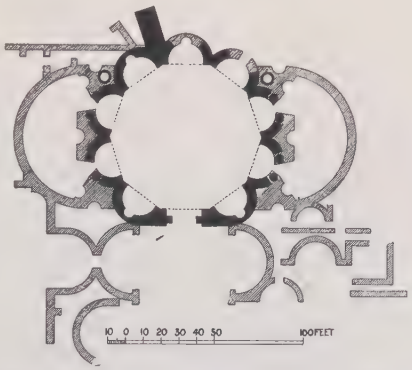
205.—SPHAERISTERIUM OF THE THERMAE OF DIOCLETIAN AS RESTORED BY M. PAULIN.

interior of the sphaeristerium (Ill. 205). The lower portion of the walls of central block Blouet considers to have been faced with marble, so as to accord in richness with the granite columns of the various halls facing the xystus. All the other walls, which were partially hidden by the groves of trees, were simply covered with stucco.

Neither of the authors avail themselves in their restorations of the terra-cotta work of the roofs which in Roman architecture constituted a very important architectural decoration, and of

which so many remains have been found at Pompeii. The roof tiles were all laid direct on the concrete vaults, but gutters and gargoyles would have been required to collect the rain and transmit it well beyond the walls. In addition to these the acroteria of the gables and the antefixae of the roof covering-tiles were much too important elements to have been altogether ignored as they are in Blouet's work.

The so-called Temple of Minerva Medica (Ill. 206) is now recognised as a portion of the Thermae of Gallienus (266 A.D.), where it served the purposes of a nymphaeum. The absence of any flue tiles in the walls, or even of the hypocaust, is a clear proof that it could not have been a sudatorium, which has been suggested on account of its decagonal form. Its principal interest is to be found in the vault, in which the earliest example of the pendentive is found. The corbelling out, however, is of the rudest kind, and was probably entirely masked by the decoration. The windows lighting the interior are of considerable size, so as to give plenty of air and light (necessary for the plants and flowers), and are in two rings*—that is to say, an outer and inner arch, the former of greater radius than the latter.

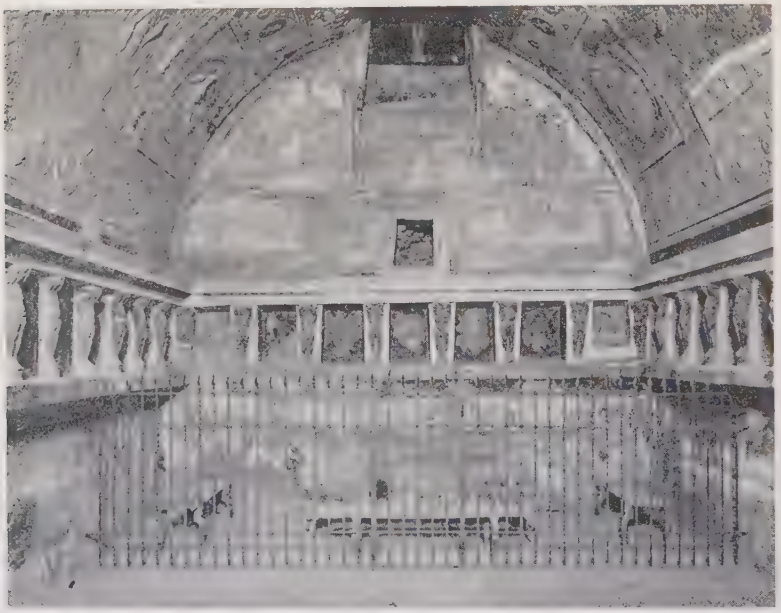


206.—THE SO-CALLED TEMPLE OF MINERVA MEDICA AT ROME.

But few remains have been found in Rome of the ordinary public baths, but in Pompeii there are three examples more or less completely preserved, and therefore of great interest. They are sometimes dignified by the title of Thermae, but cannot be said to belong to that class of monument which we have just described in Rome. The "older Thermae," north of the Forum (so called because they were the first discovered), included, besides a complete establishment for men, a small set of baths for women, the hot rooms of both were heated by the same furnace, in accordance with Vitruvius's description (v. 10).

* In the Palace at Treves are windows with three rings of arches, one set behind the other.

They covered an area of about one hundred and seventy-one feet square, exclusive of shops, which occupied two sides of the enclosure, and consisted of an open court with peristyle on three sides, a vestibule, ante-room, Apodyterium, Frigidarium, Tepidarium, and Calidarium. Of these, the most interesting is the Tepidarium (Ill. 207), which has preserved its vault richly decorated in stucco, and a series of niches sunk in the wall round the room, the piers between being decorated with figures



207.—TEPIDARIUM OF THE BATHS OF THE FORUM AT POMPEII.

of miniature Atlantes, two feet high. There was no hypocaust under the room, and it was heated apparently by charcoal in a large bronze brazier found *in situ*. The Calidarium was heated by a hypocaust and flue tiles in the walls. It consisted of a hall forty-two feet by sixteen feet wide, with a barrel vault decorated in stucco, and a semi-circular recess at the farther end which originally held the labrum ; above the same, in the vault of the recess, being an opening which could be shut or closed at pleasure. The other end of the Calidarium was occupied by an oblong bath.

The Stabian baths, discovered in 1857, were the oldest, having been erected towards the close of the second century B.C., though remodelled in later times. They covered an area of about one hundred and sixty-four feet square, including a court one hundred feet long by seventy feet wide, sufficiently large, therefore, for various exercises. The two large stone balls which were found lying in the court were probably used for games of some kind. The peristyle was on two sides only; on the third were rooms opening into the court, which may have been used for exercises or games in bad weather; on the fourth side * was a swimming bath fifty feet long by twenty-five feet wide, and six feet six inches deep, which in the Roman Thermae would have constituted the Frigidarium, a title which here is given to a circular room covered with a conical roof with opening at the top, and fitted with a central circular tank with marble linings and seats round. The conical roof was plastered over, painted blue and studded with gold stars. The same kind of Frigidarium existed in the Forum baths. Here the square niches in the wall are found in the Apodyterium, where they would seem to be of more use. The labrum, consisting of a circular marble basin resting on a stone pedestal, still exists in the Calidarium, as also the oblong bath at the other end of the hall. Apparently these baths were originally heated by braziers only, and in the restoration of the first century

208.—SOUTH-WEST WALL OF THE STABIAN BATHS AT POMPEII.

* Illustration 208 shows the south end of the south-west wall, which was decorated with reliefs in stucco representing those architectural fancies to which Vitruvius (Bk. 7, chap. 5) takes such great exception. He condemns them when painted even, but executed as these are in relief, they would have troubled him still more had they been carried out during his lifetime.

A.D. hypocausts were introduced beneath the floors of the Tepidarium and Calidarium, and the walls of the latter were doubled with flue tiles. As in the other example, there was a separate and smaller set of baths for women, both sets heated from the same furnace. The third establishment, known as the Central Baths, was in course of erection at the time of the eruption, and is interesting therefore as showing the latest developments. It occupied about the same area as the Stabian baths, but the porticus round the open court had not been built. Here the swimming bath stands outside in the open court, as in the Roman Thermae. The circular room in this case was arranged for heating with hypocaust flue tiles, and was probably intended for the laconicum, as described by Vitruvius (v. 10). The circular room in the Stabian baths was covered over with a conical roof, built in masonry laid in horizontal courses. The dimensions of this room are small, as compared with the laconicum built by Agrippa in Rome, to which reference has been made on p. 252, but as no centering was required there could have been no difficulty in its erection, and it might possibly account for the construction of the hemispherical dome of the Pantheon described on p. 234, where the bricks were laid in horizontal beds. The two circular halls in the baths of Titus, *c.* 80, B.C., were probably roofed in the same way.

209.—FRIEZE FROM THE TOMB OF THE GARLANDS AT POMPEII.

CHAPTER XIV.

ENTRANCE GATEWAYS, ARCHES OF TRIUMPH AND OTHER MEMORIALS, AQUEDUCTS, BRIDGES, TOMBS.

WHILST the Etruscan examples at Perugia may be regarded as the prototypes of the entrance gateways to towns, there are no remains of either Greek or Etruscan Arches of Triumph. These may have been temporary erections in timber only, provided on festal occasions, but not afterwards copied in stone as permanent records.* Both entrance gateways and arches of triumph would seem to have been erected to commemorate some important event, and the only real difference between the two is that the latter was an isolated feature which was generally built in marble instead of stone, and did not constitute part of the external wall of a city, as was the case with the entrance gateways both at Verona and Autun; but even in the two at Autun, in France, a festal appearance is given to them by the arcaded galleries carried across above the archways; and in the two gateways at Verona we find a series of enrichments in the form of semi-detached columns and shafts, and pilasters carrying pediments within pediments, enclosing semi-circular openings, which are quite inconsistent with the object of defence.†

* The Arch of Titus is known by its inscription to have been erected after his death. The central portion only is original; the two sides were restored in 1823, the new portions being in travertine stone.

† It is not quite certain whether these gateways were decorated only, or built, by the Emperor Gallienus (265 A.D.); but the decoration of the Porte dei Borsari shows to how low a depth Roman architectural design in the provinces had reached in the latter half of the third century.

There is, however, one salient difference: an Arch of Triumph is generally supposed to commemorate a victory, and as such offers a splendid scope for decoration with bas-reliefs setting forth the principal scenes of a campaign. This, however, if we may judge by coins, does not seem to have been the only object, for the representations shown on them of the Arches of Trajan and Domitian suggest that they were regarded primarily as pedestals to carry large groups of sculpture; the central feature consisting of a triumphal car with four to six horses, or as in

210.—THE ARCH OF CONSTANTINE AT ROME.

the Arch of Domitian, with elephants; in both cases flanked with statues.

The designs of two of the early arches of triumph, those of Trajan, are known only by coins; but some of the bas-reliefs representing the Dacian victories, and a series of statues of Dacian captives, which belonged to the arch erected on the Via Appia, were taken away in order to decorate the Arch of Constantine, he being unable to find sculptors, in his period, of sufficient artistic ability to carry out work of this kind. On the other hand, in its general design the Arch of Constantine (Ill. 210) is one of the best-proportioned of the triumphal arches.

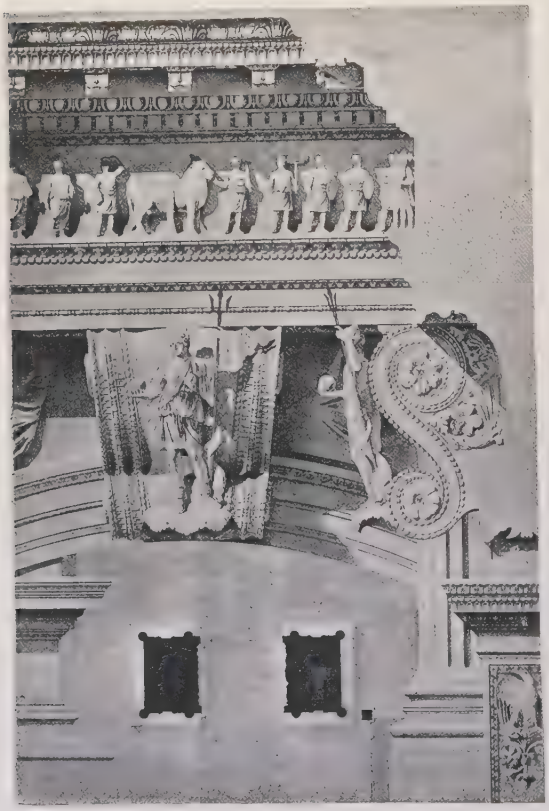
It was built 312 A.D., to commemorate Constantine's victory over Maxentius, and consists of a central archway and two side ones, flanked by detached columns and responds of the Corinthian order, raised on pedestals and carrying an entablature which returns above each column. The whole was crowned with an

211.—THE ARCH OF TITUS AT ROME.

attic storey, in front of which and over the four columns stand the statues taken from Trajan's Arch. The arch as it stands requires the quadriga, horses and statues, which it originally carried, to break the skyline.

In the Arch of Titus (82 A.D.), on the Sacra Via, erected to commemorate the taking of Jerusalem, there is only one central

archway, and the columns which flank it, and those on the angles, are only semi- or three-quarter detached, so that they form part of the actual core of the structure, and are not purely decorative adjuncts, as in the Arch of Constantine. The beauty of the figure sculpture in the frieze and elsewhere is greatly enhanced by the simplicity of the masonry throughout, when contrasted with that of the Arches of Constantine and Septimius Severus. The barrel vault of the archway is sunk with deep coffers and enrichments, in the centre being a relief of the apotheosis of Titus. The famous reliefs on each side below the vault represent on one side the Emperor drawn in his triumphal car led by Roma and crowned by Victory, and on the other the spoils taken from the Temple of Jerusalem. The columns decorating the archway are of the Composite Order, and are the earliest examples known of its employment in Rome. As the entablature is carried across between the two central columns, some visible support seemed to have been required in the centre, and this was met by the accentuation of the keystone and its projection beyond the plane of the architrave (Ill. 212). The figures carved on the keystones are



212.—KEYSTONE OF THE ARCH OF TITUS AT ROME.

213. THE ARCH AT BENEVENTUM.

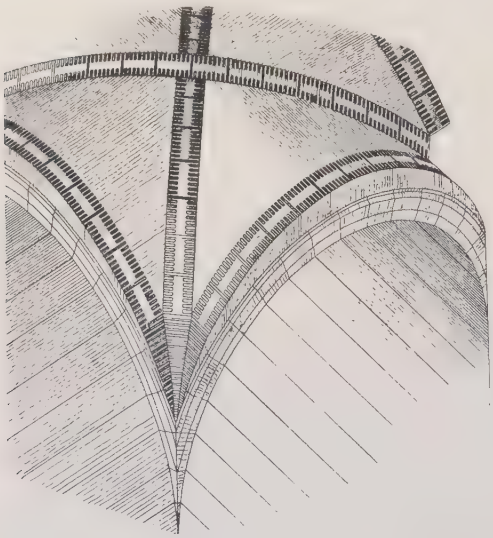
those of Roma on one side of the arch, and of Fortuna on the other. Great solidity is given to the base of the structure by having a simple podium on each side to carry all the columns, instead of a series of pedestals, as in other arches.

214.—THE GATEWAY OF THE SILVERSMITHS AT ROME.

As a frame for sculpture the arch at Beneventum (Ill. 213), built 114 A.D. in honour of Trajan, is the finest example, as the columns flanking the arch and at the angles, being only semi and three-quarter detached, interfere less with the sculptural bas-reliefs between them than in some other cases. The subjects of the same and of the friezes represent the Dacian

wars and triumphs, and the order employed is the Composite, the columns resting on a podium, as in the Arch of Titus.

Among other arches in Rome is that of Septimius Severus, 203 A.D., built to commemorate the Parthian victories, and decorated with bas-reliefs of the various episodes of the wars. The arch is similar to that of Constantine, with centre and two side arches flanked by detached columns and responds (but here of the Composite order), resting on pedestals. The frieze, which in such a structure ought to be of greater depth than usual, is here so narrow that the whole entablature seems to consist of mouldings only. On the other hand, greater breadth is given to the attic storey, which is unbroken, so as to give abundant space and more importance to the dedicatory inscription.



215.—INTERSECTING BARREL VAULT OF THE ARCH OF JANUS IN THE FORUM BOARIUM AT ROME.

The gateway built by the Silversmiths in honour of Septimius Severus (Ill. 214), in the Forum Boarium, though of great richness in sculpture, is an extremely debased conception.

The Arch of Janus, also in the Forum Boarium, is one of those structures, of which there are many in Syria, built at the junction of four streets as a shelter. It is attributed to the age of Septimius Severus, and consists of a square mass of masonry pierced on each face with an archway, the interior being covered by an intersecting barrel vault. The construction of this vault is interesting, because, according to M. Choisy, it shows that the same centering was used for both the intersecting groins. These groins were built in two rings of Roman bricks (Ill. 215). As soon as one of them had set, the hollow space between the two rings was filled in with concrete, and the centering

216. THE ARCH AT ANCONA.

having been shifted round, the other double ring was constructed, butting on each side against the first groin.

The arch at Ancona (Ill. 216) was set up in honour of Trajan 112 A.D., who built the harbour there. It is raised aloft and approached by a flight of steps, and must be regarded as a pedestal to carry a group of sculpture, now gone. As a pedestal it is a fine conception; but as an archway its proportions are

217.—THE ARCH AT ORANGE, FRANCE.

too elongated, and cannot be compared favourably with any of the examples already described.*

Outside Italy, the Arch at Orange, in France (Ill. 217), is one of the finest examples, though, in consequence of the mutilation of the sculptural decoration with which it was covered, there has been some difficulty in determining its date. It is generally

* The small arch at Rimini, erected in honour of the Emperor Augustus, is interesting, as it evidently formed the model on which Alberti based the façade of the Cathedral there built in 1450.

attributed to Antoninus Pius, better known as Marcus Aurelius, who erected it as an Arch of Triumph to commemorate his victories on the Danube and in Germany. It consists of a central and two side archways, with semi-engaged columns between the arches, and three-quarter-detached columns at the angles, raised on pedestals, and all of the Corinthian Order. It differs from other archways in the design of the

218.—NORTH FRONT OF THE ENTRANCE GATEWAY (PORTA NIGRA) AT TREVES, GERMANY.

sides, which are decorated with sculpture, pediments, and other architectural features, thus giving them equal importance with the two principal fronts. As the pediments were carried up into the attic storey, an additional storey was added for sculpture and inscriptions, which is much too heavy, and deprives the archway of much of the grace which it otherwise possesses.

The Triumphal Archway at Rheims was erected in the latter years of the Empire, if one may judge by its general design

and debased sculpture. It consists of three archways, the central one wider than the others, but all springing from imposts on the same level. The piers at the angles and between the arches are decorated by pairs of engaged columns of the Corinthian Order, raised on pedestals, with niches between the columns, as in the Arch of Titus. The whole structure is surmounted by an attic storey.

The entrance gateway, known as the Porta Nigra, at Treves (Trier), is one of the most important examples existing, and is still in good preservation (Ill. 218). It consists of an inner and outer double gateway, with two storeys of arcades with attached columns between. It is flanked by two wings, which are four storeys in height. On the entrance, or north, side these wings have a semi-circular front. Internally they measure fifty-five feet by twenty-two feet wide, constituting, therefore, important halls, though their purpose is unknown. At first sight, the arcaded galleries seem to have served the same purpose as those at Autun, but as the central court between the inner and outer gateways is unroofed, they formed the only means of communication between the wings, and the open court might have been of service in defending the entrance if the outer gateways were forced. As the gateway formed part of the external walls, the entrance to the halls on each side may have been from the ramparts, with an internal staircase in wood leading from floor to floor. An apse was added on the east side when the building was converted into a church in the middle ages, and may have caused the destruction of an external stone staircase on that side. The comparative rudeness of its architectural features is probably due to its remoteness from the Capitol.

Reference has been made in Chapter XI. to the most important archway in Syria (Ill. 159, p. 196), viz., that which was erected to form the junction between the main colonnaded street and that leading to the Propylaea of the Temple of the Sun at Palmyra; throughout the country, however, in every town built by the Romans, entrance gateways are found which in their design resemble Arches of Triumph, but were built to give more importance to the entrance to a town or to some temple. The sculpture is, however, confined to the capitals and bases of the engaged columns with which they are decorated, or, as at Petra, to the pilasters on each side of the principal archways.

The same absence of sculpture is found in the entrance gateways and triumphal archways in North Africa, where they were extremely numerous. In one town alone, Lambessa (Lambaesis), there are said to have been forty arches still standing in 1740 A.D. The most remarkable example in the country is

From a photograph by E. G. Spiers.

219.—EAST FRONT OF THE ARCH OF CARACALLA AT TEBESSA (THEVESTE), NORTH AFRICA.

the quadrifrontal Arch of Caracalla at Tebessa (Theveste), which was probably erected, like the Arch of Janus in Rome, at the intersection of two streets. It consists of a single archway (Ill. 219) on each front, flanked by pairs of Corinthian columns raised on pedestals. The frieze is made of unusual depth, so as to allow of space for inscriptions, and it is, perhaps, in consequence of this that no attic storey was provided. On the other hand, in its place, and still existing over the north front, is a canopy consisting

of four columns carrying an entablature. There was probably a niche in the centre holding a seated figure, and a second canopy is mentioned as formerly existing on the south front. The only legible inscription is one on the east face, dedicated to Septimius Severus *c.* 212 A.D. The inscription on the south face is thought to have been in honour of Caracalla. There is another Arch of Triumph at Timgad, also in North Africa, which was dedicated to Trajan, and consisted of a central and two side arches; over the latter are niches, flanked by small columns supported on projecting corbels.

Next in importance to the arches of triumph come the memorial structures, such as the columns of victory set up in Rome and elsewhere, which, by the sculptured bas-relief decoration of their shafts in the Trajan and Antonine columns at Rome, gave even a better record of the campaigns undertaken than that which could be obtained in the panels of a triumphal arch. César Daly's interpretation of the spiral bas-relief of the Trajan column as the unfolding of the volumen or papyrus scroll was a happy suggestion of the origin of this conception. We have already referred in Chapter XI. to the Trajan column (Ill. 158, p. 190). Its construction is very remarkable: it is composed of thirty-two blocks of marble, of which eight form the pedestal and twenty-one the shaft, the other three being those of the base, the capital, and the pedestal which supported the statue of Trajan. The pedestal on which the column stands is nearly a cube, measuring sixteen feet six inches wide and eighteen feet high. It is decorated on three sides with sculptural trophies of victory; on the fourth is the doorway and dedicatory inscription. The lower diameter of the shaft is twelve feet, and the spiral staircase of one hundred and eighty-five steps is carved out of the solid marble, and lighted by forty-three loopholes.

The Antonine column, erected sixty-three years later, *c.* 176 A.D., by Marcus Aurelius Antoninus in memory of his victories over the Germans, was copied, so far as its general design is concerned, from Trajan's column, and it was also enclosed in a court with peristyles on two or more storeys. Its height, ninety-six feet six inches (one hundred Roman feet), including base and capital, is the same as that of the Trajan column, its diameter being slightly in excess of the latter. In both cases the column was of the Doric order, the echinus of

220.—THE IGEL MONUMENT, NEAR TREVES, GERMANY.

the capitals being carved with the egg and tongue. The base, twelve feet high, but now buried, was composed of three degrees or steps.

The column built to the memory of Antoninus Pius, 162 A.D., by his adopted son Marcus Aurelius, consisted of a monolith of granite, forty-seven feet high; it no longer exists, but its pedestal, carved with the Apotheosis of Antoninus and Faustina, now in the gardens of the Vatican, is one of the finest examples of Roman sculpture.

Outside Rome, the columns set up at Alexandria in Egypt, Brindisi in Italy, and Cussy in Burgundy, have no special value as architectural designs, but there are two other examples of memorial structures which should be mentioned.

The first, near Treves (Ill. 220), is known as the Igel monument. It is a remarkable design, and were it not for its history might be fairly ascribed to the period of Francis I. of France. The pilasters which decorate each face have a very slight projection, and the sculpture of the capitals and panels recalls the work of the

Château de Gaillon panels, now in the court of the Ecole des Beaux Arts at Paris. The monument was set up by two brothers named Secundinus, and the sculpture decorating it represents various records of family history. It dates probably from the time of Constantine. The second example, the monument at St. Remi (Ill. 221), in Provence, is square on plan, and decorated with engaged Corinthian columns at the angles carrying their entablature, and an archway in each face. The whole is raised on a lofty pedestal decorated with bas-reliefs and is surmounted by a circular structure consisting of ten columns* carrying an entablature and a conical roof in stone.

221.—MONUMENT AT ST. REMI, PROVENCE, FRANCE.

Aqueducts and Bridges.

Among the monumental works of the Romans, though probably regarded by them purely as engineering works of an utilitarian character, were the aqueducts by which the thermae, baths, and fountains were supplied with water. These structures were by no means confined to Rome, for throughout the Empire, and more especially in the Eastern portion of it, the proper supply of water to the cities taken or founded would seem to have been the first steps taken by the Romans in civilising the barbarous tribes they had subdued. Throughout

* This would seem to have been the prototype of the turrets of the churches in the Charente, and of St. Front at Perigueux.

North Africa and Syria there still exist extensive remains of the arches which carried the channels by which water was brought, sometimes from long distances.

It should be observed that the Romans were well acquainted with the hydraulic principle that water in a closed pipe finds its own level, and Vitruvius (VIII. 7) describes the leaden pipes used, and the precautions to be taken so as to regulate the fall and rise of the water. They found it, however, much less costly to build level water channels, as the materials employed belonged to the State and the labour was that of slaves. Lead pipes, according to Pliny, were used extensively as rising mains to supply the upper floors.

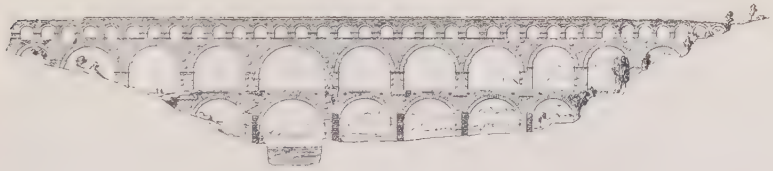
The earliest aqueduct built to bring water to Rome was the Appian (312 B.C.), which was carried underground for eleven miles, and this system was followed in the aqueduct (thirty-four miles long) built by Trajan (109 A.D.) to supply his Thermae, and in other cases. One of the first aqueducts in which portions were carried on arches above ground was the Marcian (144 B.C.). The loftiest arches are found in the Anio Vetus (272 B.C.), some of which rise over ninety feet in height. This and the Claudian Aqueduct (38–52 A.D.) were raised so as to supply water to the highest hills in Rome. One reason for suggesting that the Romans regarded them as engineering works only, is based on the absence of any attempt to introduce architectural features of a decorative nature. They depended on their superb construction alone for their monumental character. Attempts were made afterwards to enrich them (where they crossed the entrance gateways of the city), by the addition of niches, with pilasters, entablatures, and pediments (as at the Porta Maggiore), but these are quite out of keeping with their simple rusticated masonry. The construction of the piers of the Marcian Aqueduct, which is one of the finest examples, is of the type described by Vitruvius as "opus quadratum," viz., with regular courses of headers and stretchers two feet by four feet and two feet high. Round the face of each stone is a draft about one and a half inches to two inches wide, worked with a chisel; the centre is left rough and worked with a pick. The arches are set back at their springing behind the impost, leaving a ledge on which the centering was carried. The stone employed is peperino, with travertine when greater strength was required. Many of the aqueducts built in stone

222. THE AQUEDUCT AT SEGOVIA.

have been restored or added to in concrete with brick facing.* The Aqueduct of Nero was in brickwork of the finest kind.

Of aqueducts in other countries, those of Segovia and Tarragona, in Spain, where they cross valleys, are of greater height than any in Italy, and in consequence, the arches are built in two storeys. The upper arches of the Tarragona Aqueduct are forty-two feet in height, and the lower ones fifty-eight feet, with drafted masonry similar to that of the Marcian Aqueduct above described, and the piers diminish in width and depth as they rise. In the Segovian Aqueduct (Ill. 222) the upper arches are about one-third only of the height of the lower ones, the contrast giving scale to the latter. The piers of the lower arches have offsets which take away much of their monumental effect.

By far the finest aqueduct is the Pont-du-Gard (Ills. 223, 224), near Nismes, in the South of France. Its length across the



223.—THE PONT DU GARD AT NISMES, FRANCE.

valley is eight hundred and eighty-two feet, about the same as that of the two examples in Spain; but its height, one hundred and sixty feet, is greater, and it is divided into two ranges of large arches and an upper row of smaller ones, "which gives," as Fergusson says, "to the structure the same finish and effect that an entablature and cornice gives to a long range of columns."

Much of its present charm is probably due to its position in the great valley of the Gardon, and to the exquisite colour which in the course of ages the stone has acquired; but in point of design it is certainly the most remarkable building of its kind, and this seems to be owing to two characteristics: firstly, in its erection the architect renounced all those architectural superfluities with which the Romans were accustomed to surcharge

* The Alexandrine Aqueduct, which supplied the Thermae of Alexander Severus, was built in concrete with brick facing; and there is an example at Minturnae, a town of the Volci, where a decorative effect has been given to the wall surfaces by the employment of different-coloured tufa in geometrical patterns.

their buildings; and secondly, it is the result of an attempt simply to fulfil and meet the requirements of a well-defined programme. The stream, which has worn its way in the solid rock, is not quite in the centre of the valley; in other words, the slope on one side is less steep than on the other, and this gives variety to the design.

But few of the bridges constructed by the Romans have existed to the present day. Of the Pons Emilius in Rome, built by Aemilius Lepidus in 179 B.C., the foundations only exist in the Ponte Rotto. One of the best preserved in Italy is the bridge

From a water colour drawing by R. P. S.

224.—THE PONT DU GARD AT NISMES.

built by Augustus at Rimini, with five arches, the three central ones of the same span (each measuring 27 feet), and the side ones about 20 feet. The spandrels of the arches are decorated with niches, flanked with pilasters carrying entablature and pediment. Contrary to the usual Roman custom, the bridge is not carried through on the same level, there being an ascent and descent at either end. The same is found in a second bridge built by the same Emperor near Rimini, with seven arches and no architectural features.

The finest example of a Roman bridge is that across the

Tagus at Alcantara, in Spain. The length of the bridge is six hundred and fifty feet, with a level roadway through. It consists of six archways, the two central ones about one hundred feet span, those on either side sixty feet, and the outer arches forty feet. As the sides of the valley rise on either side, the relative proportion of width to height is maintained, and scale is given to the central arches by those on either side. Here also, as in the Pont-du-Gard, the arches spring from different levels. With the exception of an archway which is supposed to have been erected on the central piers, there are no architectural superfluities. The qualities of the design are based on its superb masonry and the graceful proportions generally of the piers and arches.

Tombs.

There is one other class of monument which the Romans would seem to have borrowed from the Etruscans, viz., tombs. The Etruscans, with some exceptions, seem to have considered that the most lasting memorial was that cut in the solid rock, such as those to which we have already referred at Norchia and Cervetri. The earliest existing Roman tomb is that of Caecilia Metella, of which the upper portion, consisting of a large circular drum about ninety-three feet in diameter, still remains more or less perfect on the Via Appia, outside Rome. It is faced in fine masonry and crowned by an entablature with frieze decorated with ox skulls and festoons of fruit and flowers hanging between them. The square podium on which the circular drum rested has been entirely stripped of its external masonry, so that we have no clue to its architectural design. The tomb of Augustus in the Campus Martius is known only from descriptions, but it seems to have followed on the lines of those of the earlier Etruscan tombs, such as that of Regulini Galeassi at Cervetri. Of the tomb of Hadrian there still exists in the Castle of St. Angelo the whole of the core and a portion of the great circular drum, which, as in the tomb of Caecilia Metella, rested on a podium. Here, however, the podium was three hundred and forty feet square and seventy feet high. The drum was surrounded with a peristyle of columns, and above this, and set back on the rear wall of the peristyle, was an attic storey with a conical roof. There is a tomb on the Appian Way called the

Tomb of Cotta, which dates from the Augustan era, and in its design recalls the early Etruscan tombs such as that of Regulini Galeassi already referred to (p. 146). It consisted of an immense mole, three hundred and forty-two feet in diameter, with a pyramidal roof of marble slabs and a lantern crowning the summit. The next tombs of importance, so far as dimensions are concerned, are those which are known as Columbaria. These were, however, always below the ground, and it is only in a few cases that an upper storey existed. This very often took the form of a small temple with a portico of four columns or of two columns in-antis, and of these there were many

225.—TOMB OF CALVENTIUS QUIETUS IN THE STREET OF THE TOMBS AT POMPEII.

examples on the Via Appia. The ground on each side of the road was set out very much in the same way as in our cemeteries, except that the tombs bordered the road only. Spaces of so many feet frontage were allotted to the purchasers, and enclosed with a low wall or boundary, in the centre of which was built the tomb, square, oblong, or circular, carved sometimes with figure sculpture in the same way as in Athens, but more frequently decorated with pilasters or panelling surmounted by a cornice and raised on a podium or on steps. Sometimes the area would be surrounded with a richly decorated wall, and marble seats. On the Via Appia nearly the whole of the marble decoration of the tombs has been stripped off, leaving only the concrete and tufa core; but in Pompeii, outside

the Herculaneum gate, a large number of tombs (Ill. 226) have been found *in-situ*, and are now exposed to view, suggesting similar types to those outside Rome. Of these, the Garland Tomb, on the right in Ill. 226, and in 209 and 227, represents one of the best-preserved examples. Here at Pompeii, as in Rome, the street of tombs was divided off on each side, and the enclosures still remain, there being in addition, in the rear, small sepulchral chambers with niches to hold the urns containing the ashes of the deceased. Exedrae in marble and semi-circular niches with seats were provided for the repose of those visiting the tombs.

There are but few examples of Roman tombs in Asia Minor,

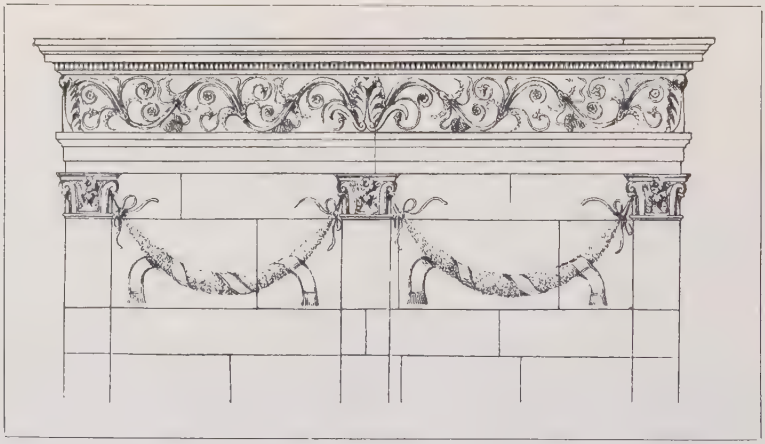
Tomb of the Garlands.

226.—THE STREET OF THE TOMBS AT POMPEII.

but in Syria they are found in great numbers. The most ancient are probably those in Palmyra. It is true that many of them were erected before the submission of the city to Rome, but their internal decoration with Corinthian pilasters shows the full development of the Roman Corinthian order. These tombs take the form of square towers from seventy to ninety feet high and thirty to thirty-two feet square, resting on a podium with no cornice, and two or three steps. Internally they are divided into three or four storeys, each storey having a series of recesses one above the other to hold coffins. On the ground storey these recesses are divided by Corinthian pilasters, and the cornices and ceilings of the chambers, all built of stone slabs, are richly decorated. The upper storeys are simpler. In one example given

in Wood* the three storeys are suggested outside by a slight diminution in the width of each, otherwise the sides are vertical.† The towers are built of fine masonry with a simple cornice, and externally the only decoration consists (half-way up the tower on the principal front) of a projecting canopy over a recumbent figure resting on a slab supported by corbels.

The tombs at Jerusalem, all of which date from about the middle of the first century of our era, are too mixed in their style to allow of their being classed as Roman work. They are all cut in the solid rock, with the exception of the upper



227.—UPPER PORTION (RESTORED) OF THE TOMB OF THE GARLANDS AT POMPEII.

part of the so-called Absalom tomb (Ill. 228), which has been built in masonry. One of these tombs, known as that of St. James, consists of a portico-in-antis of two columns between wings projecting slightly on each side. These wings are carried up a considerable height above the cornice of the portico, and in Cassas's work ‡ are shown as towers with a cornice on the top, suggesting a similarity to the front of the Temple of Jerusalem, where the pillars of Jachin and Boaz formed a similar portico

* Wood (R.), *Ruins of Palmyra*, fol. 1738.

† The example as drawn in the Marquis de Vogue's *Syrie Centrale* is shown as diminishing in width towards the top. It has apparently been reproduced from a photograph taken with a tilted camera. A photograph of the same tomb in the author's possession shows the sides absolutely vertical.

‡ Cassas (L. F.), *Voyage Pittoresque de la Syrie*, fol. 1799.

between lofty towers, as described in the Bible. There are three other tombs in Jerusalem, known as the Tombs of Jehosaphat, of the Judges, and of the Kings. In each case a court has been excavated and sunk in the solid rock, and the entrance to the tomb cut on one side of it. In the two first cases the entrance consists of a portico with moulded jambs and lintel, surmounted by a pediment enriched with debased Greek foliage. The Tombs of the Kings —now identified as the tomb of Helena, Queen of Adiabene, *c.* A.D. 75—is entered through a porch consisting of a portico-in-antis, the face of the jambs and lintel being enriched with carving; above is a Doric frieze with triglyphs and a cornice. A bunch of grapes in the centre and a palmette on each side have been carved in the place of three of the triglyphs. The entrance to the tomb is on the left-hand side of the portico, and the rolling stone by which the opening was closed still remains.

228.—THE TOMB OF ABSALOM AT JERUSALEM.

In other parts of Syria there are Roman tombs, which vary in size from twenty-five to forty feet square, and are decorated externally with Corinthian pilasters at the angles. Internally they are covered with barrel vaults or with domes on pendentives, the latter consisting sometimes of stone slabs placed across the angles. Some of the tombs in Central Syria are sunk in the rock, and over them are built groups of two or more

columns held together by their entablatures. Others follow the arrangement typified by that of the Tomb of the Kings: viz., a portico-in-antis and occasionally a pediment.

The most important of the rock-cut tombs are the magnificent examples at Petra. Cut in the vertical sides of a cliff, and rising sometimes to over one hundred feet in height, the artist was freed from the trammels of ordinary construction and was able to realise his conceptions much in the same way as a painter produces a theatrical scene. One of the examples which was commenced but never finished, shows the method employed in the setting out of the design. The steep slope of the rocky cliff was cut away, leaving a vertical face of the intended height and width of the tomb. The artist commenced by drawing, on the rock itself, the various features of the proposed design, and then (working from the top down to the base), cut back into the solid rock to the depth required to leave his conception in relief. In some cases, as notably in the Khasne, a portico of two Corinthian columns-in-antis was sunk on the lower storey, in the rear of which was the entrance door and the sepulchral chamber. The principal tombs are those of the Khasne (called by the natives the Treasury of Pharaoh), and of El Deir: the Corinthian tomb, and the tomb with the urn. The finest and best-preserved is that of the Khasne (Ill. 229), divided into two storeys, the upper one with a circular pavilion in the centre and two side wings with half pediments, all carved with the Corinthian order. The lower storey has a tetrastyle portico in the centre, the angle columns, however, not entirely detached, and two side wings. All the mouldings and ornament suggest the employment of Greek artists, and the remarkable resemblance of the central pavilion to the Choragic Monument of Lysicrates suggests that it was inspired by that building. The ornaments on the acroteria of the broken pediment would seem to be representations of eagles: those of the pediment of the portico are not distinguishable, but the figure sculpture of the tympanum and frieze, and the figures on pedestals between the columns on the upper storey, show that an artist of some repute must have been brought over to execute them. Perhaps the most remarkable feature in connection with these tombs is the exceptional care which must have been taken, in cutting away round the projecting features, as there are no instances recorded

229. THE TOMB OF THE KHASNE AT PETRA.

of new blocks being inserted where too much had been cut away. The projection of the abaci, which is greater than that usually given, was probably regarded by the artist as a tour-de-force. The illustration shows the very slight inclination of the sides of the cliff, and how little had to be cut away to procure a vertical plane for the setting out of the design.

The tomb of El Deir and "the Corinthian tomb" are of similar design, the latter having a more solid ground storey. The front of the "tomb with the urn" was carved in imitation of the tetrastyle portico of a temple, but with semi-detached columns only; the urn crowned the top of the pediment. This tomb was preceded by an open court with a porticus on each side, also cut in the rock, and a platform partly built in masonry. There is a fifth tomb, of most decadent type, with three storeys of Corinthian pilasters. As a rule the sepulchral chamber was not decorated internally. In one instance only semi-detached Corinthian columns are carved round the chamber. As evidence of originality of design and richness of execution, these tombs are remarkable examples of the Roman style, of probably the second century of our era; but the absence of any constructive character takes them out of the range of serious architectural developments.

230.—SKULL AND GARLAND FROM AN ALTAR IN THE MUSEUM OF THE VATICAN AT ROME.

231.—SIMA FROM POMPEII.

CHAPTER XV.

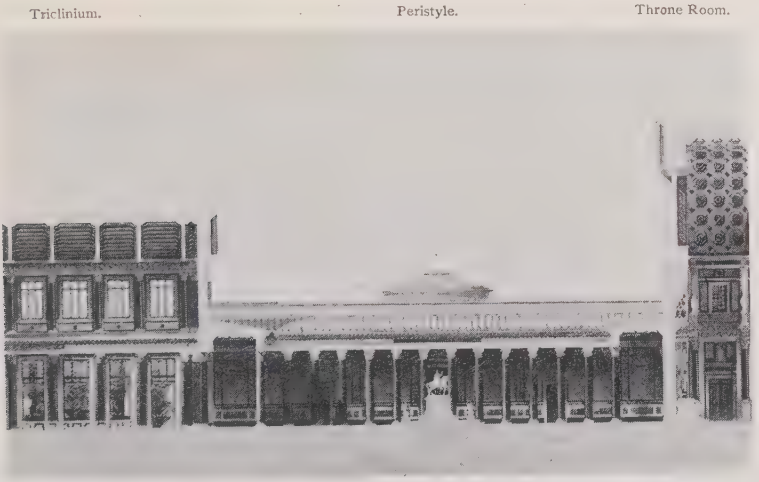
PALATIAL AND DOMESTIC ARCHITECTURE.

THE excavations on the Palatine Hill, commenced systematically by Napoleon III. under Signor Rosa in 1863, and continued since 1870 by the Italian Government, have laid bare the walls of the greater portion of the various palaces, commenced by Augustus, continued by the Flavian and Antonine Emperors, and extended by Septimius Severus. Although in the centre of the plan (Ill. 233), on the site occupied by the Villa Mills, there still remain other researches to be made,* the restorations here shown of the plans of the Palaces of Domitian and Severus are based on the walls actually found. Of that of Augustus, the south part only has been excavated, and it is probably to Guattani, who measured and published this palace prior to the erection of the Villa Mills, that M. Deglane owes his information relative to the north side of the palace. The restoration shown in the section by Dutert (Ill. 232) of part of Domitian's palace is based on portions of the walls still existing, on similar halls found in the Roman Thermae, and on the records of the marbles discovered in

* These have just (1907) been commenced and the church of S. Cesarius, once the private chapel of the first Christian Emperors, has been found.

1720 and described by Bianchini. Portions of the pavements of almost every hall in the palace still exist, and in many cases the lower part of the walls.

In these palaces, as in the thermae, the two chief principles on which the Roman architect set out his plan are clearly set forth: first, the maintenance of the axis; and second, the selection of some leading features which ruled its design. With reference to the first principle it will be noted that the walls of the several palaces and other buildings are not always parallel or at right angles to one another (Ill. 233). These



Restoration by Dutert.

232.—SECTION THROUGH THE PALACE OF DOMITIAN ON THE PALATINE HILL AT ROME.

palaces were built in successive periods and by various Emperors, and the axis of each addition was probably determined by the site available to be covered and by its prospect. Where there is a variation in the parallelism of the axis, as in the case of the Temple of Jupiter Victor (O), built 53 B.C., with that of the Palace of Domitian (S), built 85 A.D., the irregular juxtaposition of the two is masked by the rooms on the left of the Triclinium (X), so that anyone approaching the temple from the south-west should not recognise that the temple and the palace were not in parallel planes. The second principle is shown in the Palace of Domitian by the adoption of a central feature or set of features, such

as the Throne room, the Peristyle court, and the Triclinium, with a room of peculiar shape, the nymphaeum, on each side, the space at the back of the latter being filled in with small service rooms. At the back of the Triclinium are two small rooms of irregular shape, which allow the south wing (containing the two Halls of the Academy (N), to align with the axis of the Temple of Jupiter Victor and its approaches. Again, on the right-hand side of the plan, the central axis of the Palace of Severus (J) was not at right angles with the Stadium (H). This was masked by an immense hemicycle built by Hadrian (I), which formed a tribune from which the Emperor and his suite viewed the races in the stadium.

One of the most remarkable features in the plan is that which is shown in the Palace of Augustus, overlooking the Circus Maximus, where the two side wings have their fronts placed at a slight angle to one another, and are united by an immense segmental corridor (K) in several storeys, the effect of which must have rendered this palace one of the finest compositions of Roman architecture.

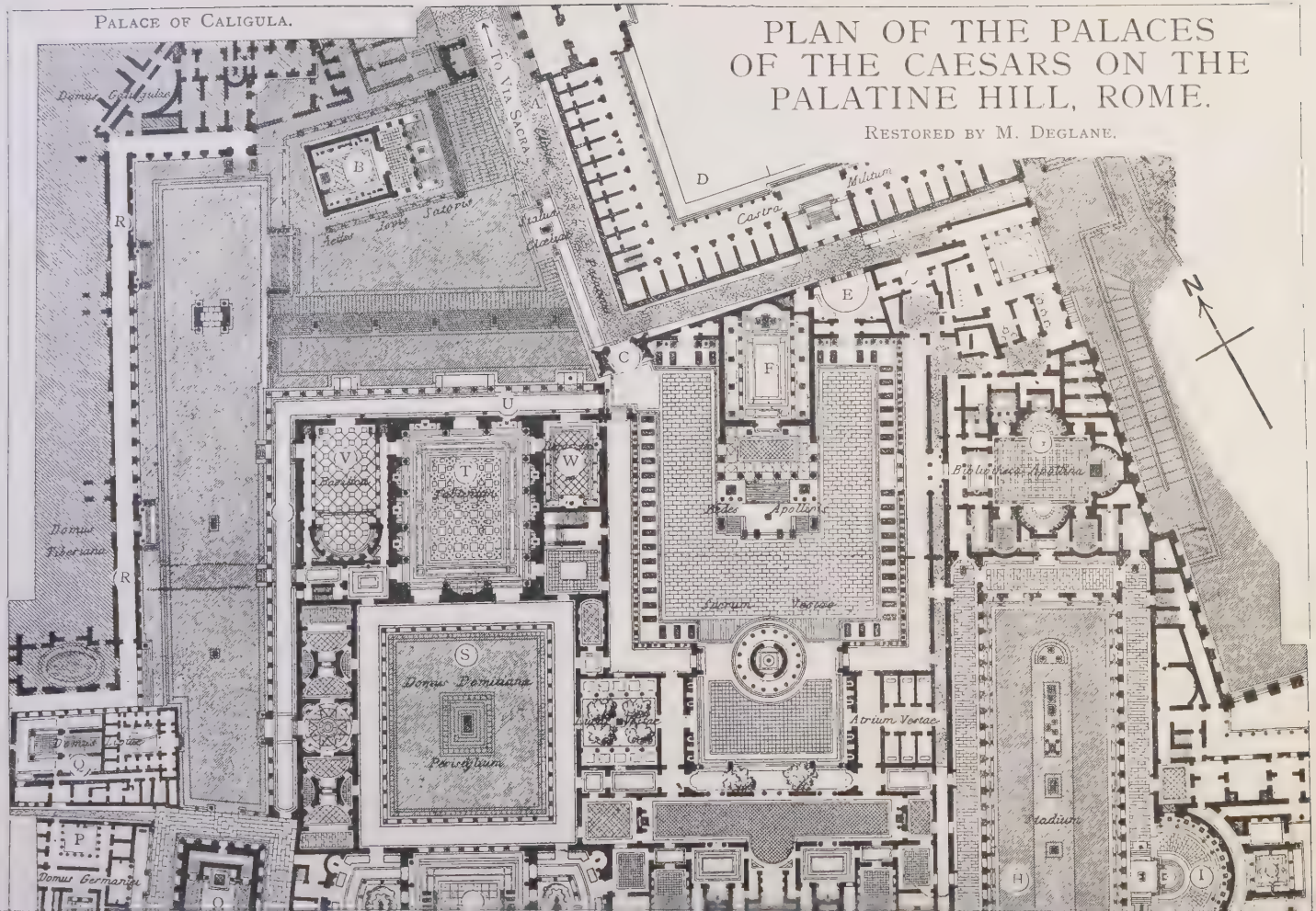
The principal approach to the Palatine Hill was by the Vicus Apollinis (A), a road which started from the Sacra Via, on the west side of the Arch of Titus, and led to an arched gateway (C) which gave access to the sanctuary of Apollo on the one side, and to the Palace of Domitian on the other. In ascending the road, about one hundred yards from the Arch of Titus, on the west side, stood the Temple of Jupiter Stator (B), of which the foundations only have been found.

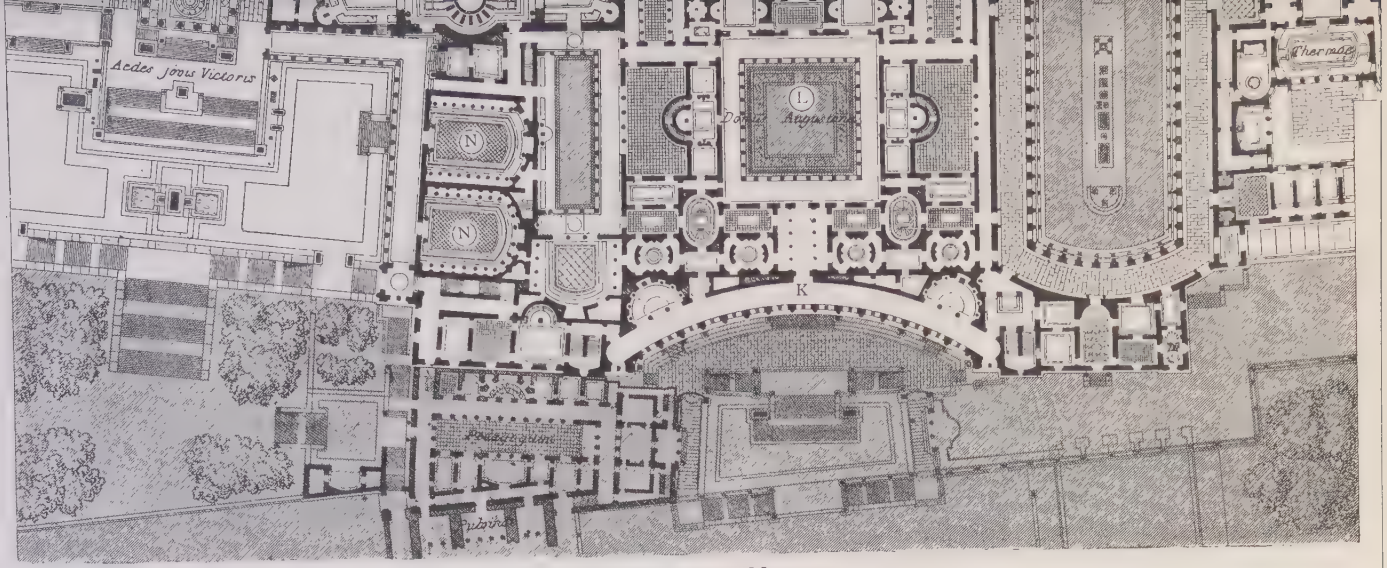
The palace built by Domitian was preceded by a portico (U). The central hall (T), assumed to have been the Throne-room, was covered by a barrel vault, which had the widest span of any in Rome, the hall being one hundred feet wide by one hundred and thirty-one feet long. The walls were ten feet thick on each side, but the thrust of the vault would seem to have been resisted by the halls on each side, there being buttresses outside the basilica on one side and piers inside the Lararium on the other side.* There were three great niches in the wall on each side of the throne room, in which were colossal statues in porphyry, and between these and the doorways were detached

* These are shown in M. Deglane's plan of existing remains, but omitted in his conjectural restoration.

Ill. 233.

Plan of the
Palaces of the Caesars
on the Palatine Hill
at Rome.


Palace of Caligula.
PLAN OF THE PALACES OF THE CAESARS ON THE PALATINE HILL, ROME.
Restored by M. Deglane.
To Via Sacra
Domus Caligulae
Aedes Iovis Satoris
Area Palatina
Clivus Palatinus
Castra
Milvium
N
Domus Tiberiana
Domus Domitiana
Peristylium
Domus Gelotiae
Domus Germanici
Aedes Apollinis
Sacrum
Vestae
Atrium Vestae
Bibliotheca Apollinis
Stadium



SITE OF THE CIRCUS MAXIMUS.

REFERENCES.

A. ASCENT FROM VIA SACRA TO PALACES.
B. TEMPLE OF JUPITER STATOR.
C. ARCHED GATEWAY.
D. SOLDIERS' BARRACKS.
E. ENTRANCE TO AREA OF APOLLO.
F. TEMPLE OF APOLLO.
G. THE APOLLINE LIBRARIES.
H. DOMITIAN'S STADIUM.
I. TRIBUNE BUILT BY HADRIAN.
J. PALACE OF SEVERUS.
K. L. M. PALACE OF AUGUSTUS.
N. ACADEMIES.
O. TEMPLE OF JUPITER VICTOR.
P. HOUSE OF GERMANICUS.
Q. HOUSE OF LIVIA.
R. CRYPTOPORTICUS.
S. PALACE OF DOMITIAN.
T. THRONE ROOM.
U. PORTICO.
V. BASILICA.
W. LARARIUM.
X. BANQUETING HALL (TRICLINIUM).
Y. NYMPHAEUM.

columns of pavonazetto and giallo-antico, monoliths twenty-four feet in height. Opposite the central doorway was the throne, in a recess. All the walls were cased with marble up to the springing of the vault, about sixty feet above the pavement.

On the west side of the Throne-room was the Basilica (V). with a row of six columns on each side, forming aisles, and in this respect corresponding to the Egyptian Oecus * which is described by Vitruvius (vi. 5). Opposite the main entrance to the Basilica from the portico was an apse, with marble seats in tiers round. On the opposite side of the Throne-room was the Lararium (W), containing an altar and surrounded by statues of the household gods. In the rear of the Lararium was a staircase leading to an upper floor, and beyond a square hall. It might here be noted that the Lararium and rooms behind it were not of the same width as the Basilica: the most important room, therefore, the Throne-room, which rose in height above the others, was not in the central axis of the front, but this was masked by the archway which gave access to the Area of Apollo. Beyond the Throne-room was a great central court (S), surrounded by a peristyle, with columns of pavonazetto marble and halls on either side. In the centre, on the south of this, was the Triclinium (X), or state dining-room, which opened on each side † to what was virtually a conservatory, as in the Nymphaeum (Y) were fountains, plants, and flowers, with niches at the back in which were statues; the centre portion probably being open to the sky. All these halls, as also the walls of the peristyle, were lined with rich marbles. The pavement of the Triclinium was of the description known as "opus sectile," which consisted of thin pieces of marble and porphyry cut in shapes to suit the pattern.

The Palace of Augustus (K, L, M) covered less area than that of Domitian, but contained a very much larger number of rooms, the purpose and lighting of which are not very clear. The north portion of the palace, which seems to have had its principal entrance from the Area of the Temple of Apollo, has not yet been excavated, so that the plan of that portion was

* The title of Egyptian Hall given to the great banqueting-hall in the Mansion House is probably derived from Vitruvius's definition.

† The hall on the east side has not yet been excavated, being under existing buildings.

probably taken by M. Deglane from Guattani's drawings, made before the Villa Mills was erected. All the south portion has been excavated, and the rich marble work of the lower part of the walls and the mosaic pavements were found *in-situ*. Portions also of the vaulting retained their rich decoration in stucco work.

The ingenious way in which the rooms vary in their form and proportions would be of greater interest if we knew for what purposes they were used, and how they were lighted; and the same applies to those of the northern portion of the palace, the most singular features in which are the narrow passages (fauces) between the chief reception halls. Here, as in the Thermae, all the service of the Palace was carried on in vaulted corridors underneath, and of these there must have been at least two or three storeys under the south front, owing to its elevation above the Circus Maximus.

No excavations have yet been made on the site of the Temple of Apollo (F), so that its restoration, as well as that of its peribolus, the peristyle round, and the circular temple, are purely conjectural. Fragments of the fifty-two monolith columns of giallo-antico, described in classic authors, have been found, as also some of the torsoes of the statues of the daughters of Danaus which stood between the columns. Of the equestrian statues representing their husbands, the sons of Aegyptus, which were erected on pedestals and stood in front as shown on the plan, no remains have been found. All the authorities are agreed that the Temple of Apollo was octastyle and peripteral, so that M. Deglane's conjectural restoration requires more explanation.

The famous Library of Apollo (G) consisted of two halls, used as libraries, one for Greek, the other for Latin manuscripts; and a central hall, the walls of which were decorated with portrait reliefs of celebrated writers in the form of medallions of gilt bronze.

The greater part of the Palace of Hadrian, built in the rear of the great tribune which he constructed, facing the stadium, is covered by the later Palace of Severus (J). The portion included in the plan (to the right) shows only the tepidarium, calidarium, and frigidarium of the thermae attached to the palace, and substructures of the latter, which extended three hundred and fifty feet from the stadium wall. To the north of

the Temple of Jupiter Stator (B) was the Palace of Caligula and, to the west of the House of Livia (Q), the Palace of Tiberius.

On the left-hand side of the plan is shown the Cryptoporticus (R), which extended from behind the Temple of Jupiter Stator to the House of Livia. At right angles to this, and crossing the staircase behind the basilica of Domitian's Palace, was another vaulted corridor not shown on the plan, affording a private access to and exit from the Basilica.

The Cryptoporticus was covered with a barrel vault, and lighted by a series of windows on one side formed in the springing of the same. The vault was enriched with paintings and mosaics, and the walls were lined with slabs of marble of different kinds, affixed by clamps of iron and bronze, some of which still remain.

Hadrian's Villa at Tivoli.

The great dissimilarity between the many conjectural restorations of the plan of Pliny's Laurentine villa, based on his description alone, shows the great difficulty which is experienced when there are no actual remains upon which to base any conception.

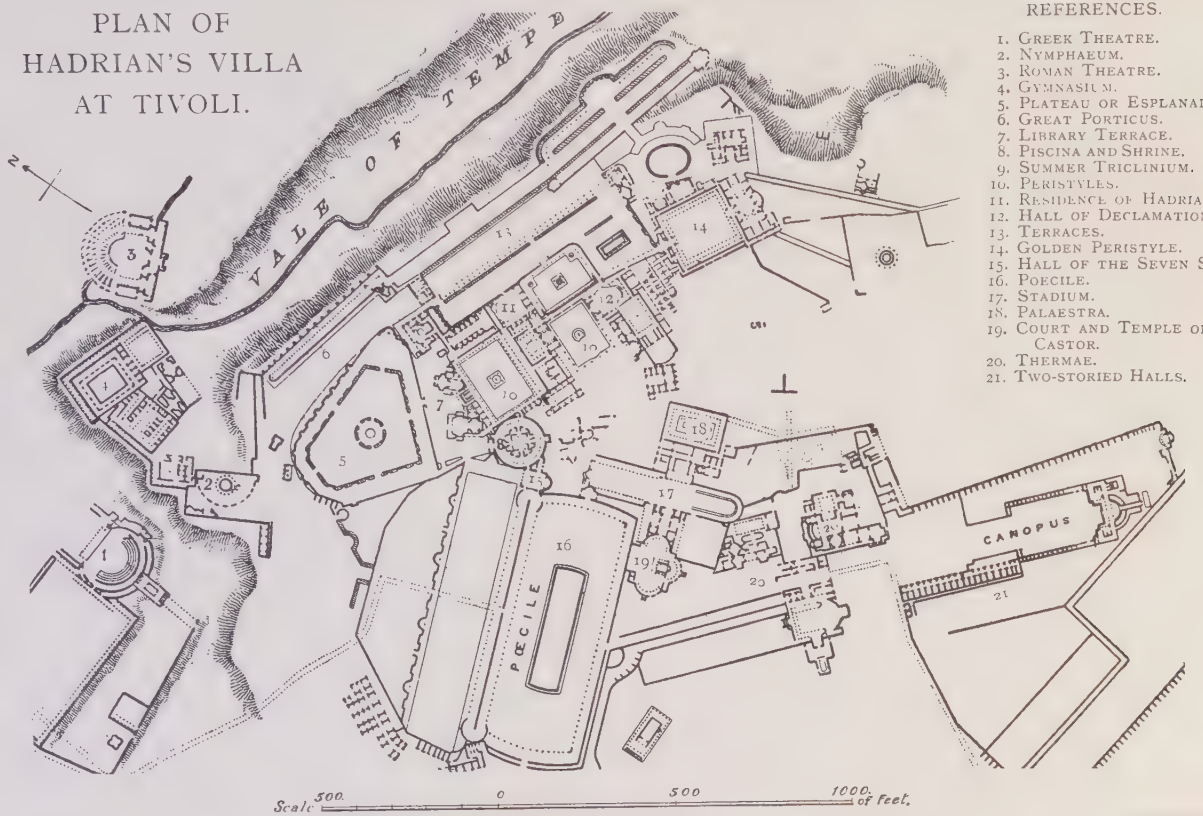
In this respect we are more fortunate when dealing with the Villa of Hadrian near Tivoli; for although completely wrecked by Totila and his hordes in the sixth century, and excavated and ransacked for treasures from the sixteenth century onwards (in which operations considerable portions were further destroyed), there still remained sufficient in the middle of the seventeenth century to allow of fairly accurate plans being made by Piranesi. Other plans were made by Nibby and Canina in the first half of last century, and since then, in 1865, a much more careful and systematic survey by M. Daumet, *Grand Prix de Rome*, followed by others of the French school. The plan here given is borrowed from Gaston Boissier's work, *Rome and Pompeii* (Ill. 234). It was based on that supplied to him by M. Daumet, so far as the range of buildings, which include the imperial palace and libraries, the terraces, the golden peristyle, the palaestra, and the poecile, are concerned. The theatres, the gymnasium, the thermae, and Canopus are taken from Nibby's work, *Descrizione della Villa Adriana* (1827). The site selected by Hadrian for his Villa is situated to

the south of Tivoli, and consists of a ridge running from north-west to south-east, and of varying heights, between two valleys, one of which, called by him "the Vale of Tempe" (in recollection of the beautiful Thessalian valley which in the course of his extended travels he had visited), is much deeper than the other, and still preserves its natural features.

The total area which was occupied by the Villa is said by Nibby to have been over seven square miles. We propose to confine our attention to the most important portion only, viz., the Imperial Palace and the various structures in its vicinity shown on the plan (Ill. 234).

The Villa was commenced about twelve years before Hadrian gave up the cares of the Empire, and as the oldest portions, according to M. Daumet, are those of the Imperial Palace, we may assume that he commenced with his own residence; he died, however, three years after his retirement (in 138 A.D.), and therefore it is evident that a very large number of the other structures must also have been built prior to his leaving Rome. Opinions differ widely as to the exact purpose of some of the various edifices, and whilst some archaeologists maintain that in them, Hadrian attempted to reproduce some of the more remarkable monuments which he had seen in the course of his travels, others (and among them M. Daumet) are of opinion that the names only of these monuments were given to buildings, which were carried out in the Roman style. In some cases, as in the Stadium and Palaestra adjoining, in the Greek Theatre, and in the Poecile, these may have been intended as reproductions of similar constructions in Greece; but as the Roman vault figures in most of them, it is evident that the general scheme only was Greek, the construction Roman. In the Imperial Palace and the great terraces (portions of which were raised on immense substructures on the side of the Vale of Tempe) the Roman and not the Greek treatment of such work is very apparent, and even in Canopus, built in recollection of the famous resort of the Egyptians near Alexandria, the whole of the building is essentially Roman, and its only connection with Egypt was the name given to it and the treasures brought from that country with which it was enriched.

The plan (Ill. 234) shows the general configuration of the site on which the principal buildings were erected. The highest point of the ridge is occupied by the Golden Peristyle (14),


PLAN OF
HADRIAN'S VILLA
AT TIVOLI.
VALE OF TEMPE
N
REFERENCES.
1. Greek Theatre.
2. Nymphaeum.
3. Roman Theatre.
4. Gymnasium.
5. Plateau or Esplanade.
6. Great Porticus.
7. Library Terrace.
8. Piscina and Shrine.
9. Summer Triclinium.
10. Peristyles.
11. Residence of Hadrian.
12. Hall of Declamation.
13. Terraces.
14. Golden Peristyle.
15. Hall of the Seven Sages.
16. Poecile.
17. Stadium.
18. Palaestra.
19. Court and Temple of Castor.
20. Thermae.
21. Two-storied Halls.
POECILE
CANOPUS
Scale 500. 0 500 1000. of Feet.

so called on account of the richness of its marble decoration. Thence the ground falls gradually about twelve feet to the terrace of the Libraries, and the plateau or esplanade (5), which was laid out as a garden, is about fifteen feet lower still. Beyond that, towards the north, the ground sinks rapidly, rising again farther on, so that the Theatres (1 and 3) are partly excavated in the sides of a hill, and an elevated plateau gives a prominent position to the Gymnasium (4). On the west side of the ridge the valley occupied by the Poecile (16) is only six or eight feet below the Library terrace (7); but the ground sinks again towards the south to Canopus, where an artificial lake was excavated in the tufa rock.

At first sight the buildings seem to be arranged in the most irregular way, and without much reference one to the other; but the various levels of the site, and the prospect and aspect thought requisite for some of them, may have accounted for this. As regards the Theatres, the Romans always availed themselves of a hilly slope in which the cavea could be excavated,* and the sites selected here at Tivoli accounted for their position, as also for that of the Gymnasium. The two Libraries faced north, in accordance with the rules laid down by Vitruvius; the walls remaining of these buildings still rise to a considerable height, and in the western library some are so thick as to suggest that they carried a tower used as an observatory.

The position of the terraces (13) overlooking the Vale of Tempe would seem to indicate that the residential part of the Palace occupied the range of buildings and courts from the Esplanade (5) to the Golden Peristyle (14), where the state receptions were held; and it was from these terraces that the finest views were obtained—views which to the present day, in consequence of the preservation of the natural features, are still a source of admiration to the traveller. No. 9 on the plan we have assumed to have been the principal Triclinium, because it faces north-west, an aspect also recommended by Vitruvius. The various courts (10) of the Palace are all planned regularly, No. 11 being apparently the private residence of the Emperor. No. 12 (thought to have been a basilica with double apse) was, according to M. Daumet, a hall

* The Theatres of Balbus, Pompey, and Marcellus, in the Campus Martius at Rome, are exceptions, probably due to the fact that the sites belonged to the State.

of declamation, and with the exception of the vaulted hemicycle at the west end, was open to the air. The semi-circular lines shown opposite were seats for the audience, and a velarium probably was suspended over the hall.

Judging from the mosaic pavements found, and portions of the columns of the portico and the walls, the Golden Peristyle (14) must have been one of the richest monuments of Hadrian's time. The octagonal hall on the south side, with four recessed niches in the angles and a semi-circular apse on the south side, held many of the most celebrated Greek sculptures and bronzes, and, according to M. Daumet, was lighted from the top in a special manner in order to display them to the best effect. A series of terraces and peristyles at various levels led down to the valley. All the walls and substructures cease, however, about two hundred feet from the stream, so that nature again asserted itself there, as it does at the present day.

The purpose of No. 2 on the plan is not known. Prof. Lanciani calls it a Nymphaeum, which, to judge by the drawing given in his work *Ancient Rome*, is the most probable. By others it is called an Odeon, or music hall. The one structure about which there is no doubt is the Poecile (16), built in imitation of that at Athens described by Pausanias, and here decorated with copies of the celebrated paintings by Polygnotus which existed in the Greek example. The remains consist of an immense wall seven hundred and fifty feet in length, with a portico on each side, of which the travertine bases on which the columns stood still exist *in-situ*, as also the marble panelling of the lower portion of the walls. The walls of No. 15, called the Hall of the Seven Sages, still exist in sufficient preservation to allow of a conjectural restoration by Canina, not, however, worth very much, as his work on the Villa of Hadrian is the poorest of his otherwise fine conceptions. Between the Libraries and the Poecile, the planes of which form an obtuse angle, there is a large circular building (8) which seems to have been designed to connect the two. Within the circular wall of the enclosure was a peristyle, and in the centre (with a tank of water round, three feet deep, and with four small bridges across) are the foundations of a structure, the conjectural restoration of which has puzzled many antiquaries. It may have been built to hold a celebrated statue in the centre, and others in niches round.

No. 19 consisted of a court with semi-circular recesses, as in the Forum of Augustus, and probably similarly decorated; and also a small temple dedicated to Castor and Pollux. No. 17 was the Stadium, with Palaestra (18) on the east side; and No. 20, two complete thermal establishments, one for men, the other for women. The small temple south of these is supposed to have been dedicated to Mars, and the cluster of buildings north-west of the Poecile and its court were those of the slaves and retainers of the Emperor.

Of other buildings there is no distinct record, so that now we come to the last and most remarkable building, that known as Canopus. Canopus was a suburb about thirteen miles from Alexandria, in which there was a Temple of Serapis, whither people proceeded from all parts of Egypt, some for religious purposes and others for pleasure, for besides various temples there were numerous hostelries on either side of the canal which led there from Alexandria, and this on festal days was crowded with the light barks shown in Egyptian paintings not unlike the Venetian gondolas. Hadrian was apparently attracted by what he had seen at Canopus, and in the valley adjoining his villa he excavated an artificial lake, seven hundred and eighty feet long by two hundred and sixty-two feet wide, and at its south end erected one of those immense vaulted hemicycles in which the Romans delighted, surrounded by niches in which were placed the statues he had brought from Egypt.* Raised aloft in the centre was the statue of Serapis, the great divinity of Canopus. Beyond, as may be seen in Piranesi's etching, was a vaulted tunnel, down which water flowed in cascades and supplied the artificial lake. On this lake boat races took place, and, in order to recall the hostelries of Egypt, there were a number of two-storied halls (21) on the west side, where the guests invited by Hadrian took their repasts and probably tarried awhile. The great hemicycle, with a diameter of about seventy-five feet, was vaulted over, and its walls lined with marbles, with columns between the niches. In front of it was a double portico, on the marble roof of which the principal visitors witnessed the games and races.

The ruins which remain at Tivoli represent only the more solid portions of the constructions, but the landscapes which

* Many of the statues found, now in the Vatican, however, would seem to have been carved in Rome in imitation of Egyptian work.

decorate the walls of Pompeii suggest that in the Roman gardens there were many varieties of ephemeral structures in wood (such as small temples, shrines, nymphaea, etc.), arbours of trellis-work carrying vines, groves of laurel, streams, fountains, and cascades. Alleys of trees are frequently referred to by Pliny, as well as box trees cut into various capricious shapes, which recall those existing at Versailles and in many of the English formal gardens.

The Palace of Diocletian at Spalato.

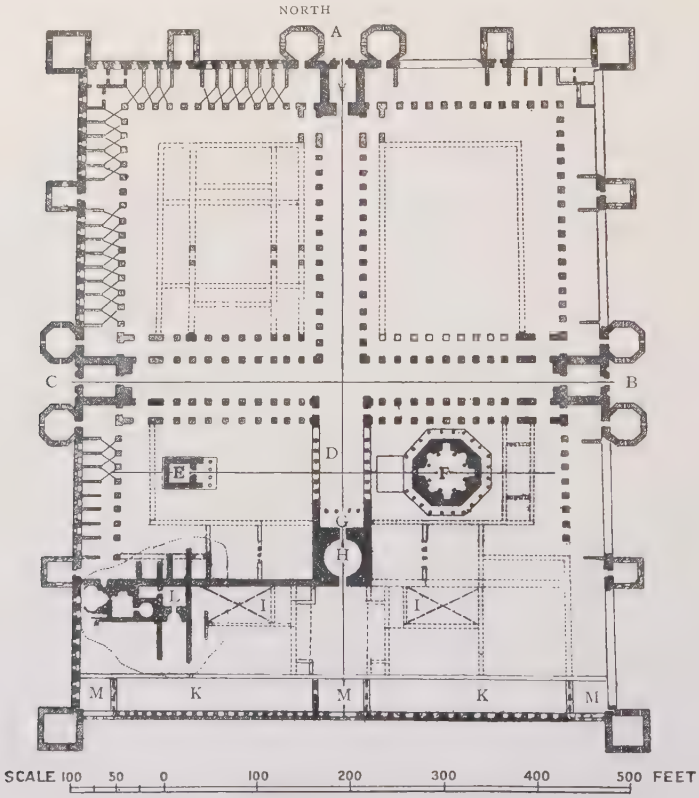
The Palace of Diocletian at Spalato, to which he retired in 306 B.C., differed from the usual plan of a Roman villa in that it constituted a fortress as well as a palace, the northern, eastern, and western walls being protected by towers, and the south front by the sea.* The palace measured six hundred and ninety-eight feet from north to south, the north front five hundred and seventy feet, and the south front five hundred and ninety-two feet. There were three entrance gates, called respectively the "Porta Aurea," or Golden Gate (Ill. 235, A), on the north side, the principal entrance, facing the avenue leading to the palace; the "Porta Aenea," or Brazen Gate (B), facing the east; and the "Porta Ferrea," or Iron Gate (C), facing the west. Three avenues, thirty-six feet wide, with covered arcades on each side, led from each gate up to the centre of the whole enclosure. South of this was the approach to the palace (D), consisting, on the right and left, of an arcade in which the arches are carried direct on the capitals without any intermediate entablature. In the courts to the rear of these arcades were two temples—one dedicated to Aesculapius (E), which was tetrastyle, prostyle, with a vaulted cella; the other, called the Temple of Jupiter, a circular temple (F) with a domical vault, remarkable for its construction, and decorated internally with niches and detached marble columns of the Corinthian and Composite orders superimposed. Externally the temple† was octagonal and

* Robert Adam, the author of the only complete description of the palace, published in 1766, considered the towers to have been added as decorative features only; but the Romans at Palmyra and Baalbec adopted an entirely different method of decoration when they desired to give a monumental appearance to their structures. Besides, the inner and outer gates at the three entrances with open courts between show that some kind of defence was intended.

† Fergusson considers this temple to have been built by Diocletian to serve as his tomb. His remains are said to have been placed in a sarcophagus in one of

surrounded by a peristyle, the whole raised on a podium. On the north side of the enclosure were great blocks of buildings, supposed to have been those of the retainers and servants.

The entrance portico of the Palace consisted of four columns in-antis (G), the two central ones wider apart and spanned by



235.—PLAN OF THE PALACE OF THE EMPEROR DIOCLETIAN AT SPALATO.

an arch, round which the whole entablature is carried in the same way as in the Propylaea at Damascus (p. 198). This portico led to a circular hall (H) lighted from the top, which is virtually the only great hall still remaining. The foundations of other walls show that there was an extensive series of large halls (presumably lighted by at least two

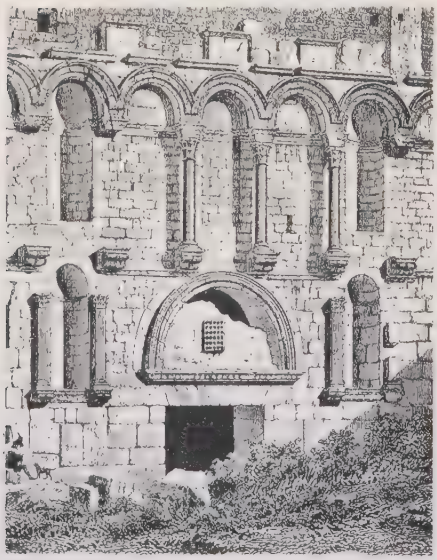
the angle octagonal towers of the south front, probably the one on the west side, near his own private apartments.

internal courts (I I)), the finest of all being the long gallery called by Robert Adam the Cryptoporticus,* which consisted of a corridor (K) five hundred and twenty feet long and twenty-four feet wide, with a range of fifty-one windows on the south side facing the sea. This great gallery served to connect all the various halls on its north side, and, being probably filled with works of art accumulated by Diocletian, must have presented a magnificent appearance. On the west side of the palace the remains were found of a complete establishment of baths (L). It is not, however, clear whether these were in the basement, as suggested in Cassas's plan †; or on the principal floor as shown in Robert Adam's conjectural restoration of the plan. They have been repeated on the opposite side, but as yet there is not sufficient authority for such an arrangement. The range of windows in the walls forming the external enclosure shows that there was an upper storey round the whole palace, interrupted only by the open courts between the inner and outer gateways. Externally the design of the southern gallery suggests that at each end and in the middle were halls (M M) separated by columns. These halls were raised higher than the main gallery, and lighted by immense windows, a design being employed in them similar to that in the entrance portico, viz., having a central inter-columniation spanned by an arch. All the columns dividing the windows were semi-detached and carried on corbels. The same disposition is to be observed in the Golden Gateway (Ill. 236), where the upper part is decorated with a series of arches carried on six detached columns, resting on richly-carved corbels. Within two of the arches are semi-circular niches, and under the latter two others which flank the relieving arch of the entrance doorway. The principal interest attached to the palace at Spalato lies in the decadent forms of some of its architectural features, which are looked upon as the precursors of the Byzantine and Lombard styles. As a matter of fact, the decadence had already set in at least one or two centuries earlier. It has already been shown (p. 199) that the arch

* The term cryptoporticus is, as a rule, given to a vaulted corridor underneath the ground, which served either as private communication for the owner of the house or palace, or for the service of an establishment. The term is quite as unfitting for this great gallery as it would be for that at Haddon Hall.

† In the publication by Lavallée of Cassas's plans he copies without any acknowledgment the conjectural restoration given by Adam.

over a wide central inter-columniation dates back to 151 A.D., being found in the Propylaea at Damascus (Ill. 160), and in the Temple at Atil (Ill. 161). Capitals carrying an arch without an intervening entablature are found at Pompeii.* Columns carried on corbels existed in the Thermae of Titus, built in the first century A.D., between the niches of the great hemicycles on either side of the enclosure (see Palladio's work on the Roman Thermae), and the accentuation of the Roman relieving arch over a lintel by enriching it with mouldings, is found in the second century in the synagogue at Kefr Birim (Ill. 237) twenty-four miles east of Jean d'Acre, in Syria.



236.—THE GOLDEN GATEWAY, DIOCLETIAN'S PALACE.

These are the four leading features of the decadence in Roman architectural forms, and although not introduced for the first time in the Palace at Spalato, they are certainly exhibited in it in a more striking manner than in any other building.

Private Houses.

The paucity of remains of ancient private houses in Rome, confined almost to the House of Livia on the Palatine, and to the House of the Vestals, would, even with the descriptions of Vitruvius, give us but a poor insight into their design were it not for the discovery of Pompeii and Herculaneum. It is true that these latter were provincial towns of second or even third-rate importance, but a comparison of the design and execution of their houses with the buildings just cited shows that the difference consisted chiefly in the employment of real marble in Rome instead of painted imitations, and in a superior style of execution in the wall paintings. The lavish

* Choisy, *Histoire de l'Architecture*, p. 515.

extravagance in the marble decorations of the mansions of the more wealthy citizens, and the rapid growth in the use of this luxury, are referred to by Pliny (xxxvi. 15), who says "that the house of Lepidus (B.C. 76) was considered the finest in Rome, and thirty years later was not the hundredth." According to Pliny, the extravagance consisted in the employment of monolith columns of various Greek marbles and the lining of all the internal walls with marble panelling such as is found in the Pantheon and in the Palaces on the Palatine.

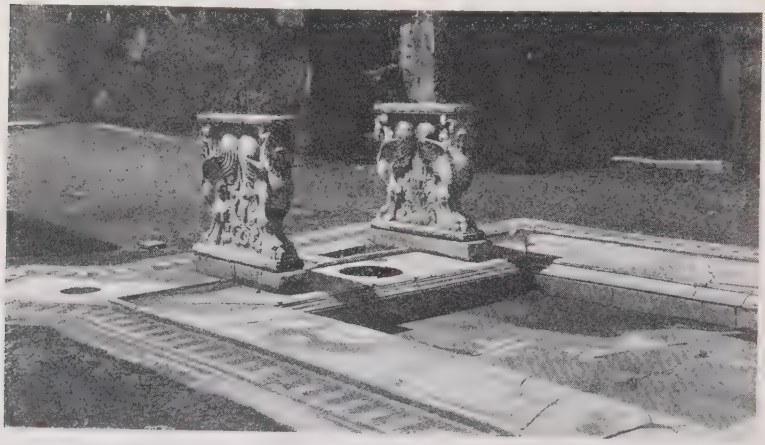
The descriptions detailed by Vitruvius, and the names he gives to the several apartments, apply so closely to those found in Pompeii that one is able to follow generally the arrangement of plan, though his attention would appear to have been directed more to the correct proportions of the various rooms than to their relative positions which were fixed by tradition.

237.—THE ENTRANCE DOOR OF THE SYNAGOGUE AT KEFR BIRIM.

The houses at Pompeii seem all to have been arranged on a similar plan, the size and number of the apartments varying according to the rank and means of the owner and to local circumstances. There is but little architecture in the exteriors, which consisted either of blank walls or of shops with open fronts, and the light was admitted to the rooms (at all events on the ground floor), from the courts in the interior. This was doubtless for the sake of

greater privacy, and the same custom still obtains throughout the East. The houses of the upper classes were divided into two parts, in accordance with the domestic customs of the Romans and their double life; the first being public and the second private. The public part comprised the prothyrum, atrium, cubiculae, tablinum, alae, and fauces. The private part, the peristyle, triclinium, oecus, cubicula, bibliotheca, exedra, lararium, and offices (see Ill. 239).

The Prothyrum, or vestibule, was a passage between the shops leading to the atrium. It was sometimes preceded by a recessed porch. The Atrium was the largest hall in the public part of the house, and it was here that the host received his



238.—THE IMPLUVIUM IN THE HOUSE OF CORNELIUS RUFUS AT POMPEII.

friends and supporters. Except in the case of the poorest houses, the atrium was always lighted through an opening in the centre of the roof called the compluvium, and the rain falling from the eaves direct, or collected in a gutter and passing through lions' heads (Ill. 231, p. 286), was discharged into a tank called the impluvium (Ill. 238), about eighteen inches deep and generally lined with marble. At one end of the tank, and opposite the entrance to the atrium, was a small marble table, and a figure in bronze or marble sometimes holding a vase or flower from which water poured into the impluvium. Of the five varieties of atriums described by Vitruvius, the Tuscan atrium is the one which seems to have been most generally adopted in Pompeii. The roof was

probably framed with two transverse beams crossing the atrium, and two longitudinal beams trimmed between them to form the opening or compluvium, in the same way as a roof or ceiling is framed over a billiard table. These beams carried the roof joists and ceiling. Where the width of the atrium was too great to allow of its being spanned by beams, columns were placed at each angle of the impluvium to support them, and this variety is described by Vitruvius as the Tetrastyle atrium. In houses of importance, where in consequence of the size and number of rooms round the atrium more space was required, a larger number of columns carried the roof with the compluvium enclosure, and his arrangement was known as the "Corinthian atrium."*

There was a fourth variety, known as the "atrium displuviatum," where the roof sloped down outwards (as seen in the tomb at Corneto (Ill. 127, p. 150), so that the rain was carried to the outside, away from the compluvium. This sometimes necessitated the employment of trough gutters, with rain-water pipes in the angles of the atrium to carry off the rain. These, however, Vitruvius says (vi. 3), "are constantly in want of repair, for the pipes which receive the water from the eaves being against the walls, and not capable of taking at once the water which should be carried off, it overflows from the check it meets and injures the woodwork and walls in this sort of buildings." A much better light, however, he points out, was given to the atrium and the rooms round.

The "atrium testudinatum" (where there was no opening in the roof) was found only in the smallest houses or where there was an upper storey. In these cases light was obtained from an open court beyond.

The rooms round the atrium were:—

a. *Cubicula*, or small sleeping rooms, generally set apart for visitors or for the male portion of the family.

b. *Alae*, or wings, recesses for conversation or reading.

c. *Tablinum*, a large room facing the vestibule, always opening into the atrium and sometimes into the peristyle or a portico beyond, without any wall or separation. Curtains were probably drawn across this room on either side, and in Herculaneum and Pompeii bronze hooks have been found to which they may

* The title had nothing to do with the Order in Pompeii, for as often as not the capitals were either Tuscan or Ionic.

have been suspended. This room contained the family archives, statues, and pictures.

d. *Fauces,* passages which admitted of passing from the public to the private portion of the house without passing through the tablinum.

In the private portion of the house were :—

e. *The Peristyle,* which resembled the Corinthian atrium, having a colonnaded portico round it, but it was much larger. The central court, open to the sky, was planted with flowers and shrubs, with a small fountain in the centre. The margin round this court was of stone and sunk in the centre, to form a gutter to carry off the droppings from the eaves.

f. *Cubicula,* or sleeping apartments, for the owner and his family.

g. *Triclinium,* or dining-room, the name being derived from the three couches placed round a central table, leaving the fourth side open for the service. Sometimes these rooms were of large size, so as to accommodate an increased number of guests, and a summer triclinium facing the north is occasionally found.

h. *Oecus,* the largest room in the private portion of the house, usually in the central axis of the house and facing the peristyle. According to Vitruvius, this was the hall occupied by the mistress of the house and where she received her guests, but it was also used as a banqueting room on special occasions, probably on account of its size.

i. *Pinacotheca,* or picture gallery for easel pictures, not often found in Pompeii.

k. *Bibliotheca,* or library, a small room to hold papyri or rolls of manuscript.*

l. *Exedrae,* rooms corresponding with the alae in the public portion of the house, but here occupied by the family or the female guests.

m. *Lararium,* a chamber devoted to the Lares, or household

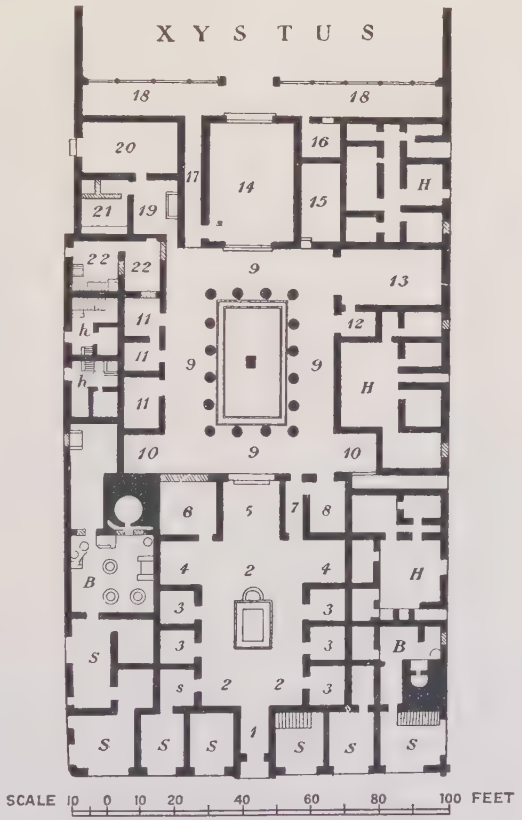
* In the excavations made at Herculaneum in 1753, a library in a private house was discovered with bookcases round the walls and one in the centre of the room. Although it contained about 1,700 papyrus rolls, the room was not larger than fifteen feet by twenty feet, which suggests that the Roman library was probably used as a store only for such documents, which were taken out and read in the exedra or other apartments of the house ; and this is rendered more probable from the fact that the Roman libraries were never warmed, either from fear of fire or from the damage which might be done to the papyrus rolls by insects or moths.

gods. Sometimes a niche at one end of the peristyle would be considered sufficient.

n. *Culina*, the kitchen.

o. *Xystus*, or garden, at the back of the larger houses only, sometimes with a portico facing it, or, as in the Villa of Diomede, on all sides.

The kitchen and store-rooms were of small size, and placed on one side of the farther end of the peristyle, with a back entrance. The upper floor of the house (when it existed) was probably occupied by servants or slaves, but sometimes there was a solarium, or terrace.



239.—PLAN OF THE HOUSE OF PANSA AT POMPEII.

The house of Pansa is the best representative of the more important residences in Pompeii, as it contains nearly all the rooms which are referred to by Vitruvius. It occupied, with the shops, two bakeries, and three small residences (all apparently let out by him), an entire block or insula covering an area of about three hundred feet long by one hundred feet wide. The entrance to the house (Ill. 239) was in the centre of one end of the block, through a lofty doorway flanked by pilasters in stone with Ionic caps, carrying presumably an entablature and pediment, now gone. Passing through the porch and vestibule (1), one enters a Tuscan atrium (2), with

impluvium in the centre, and three small rooms (cubiculae) (3) on each side, one of which (*s*) on the left was apparently occupied by the "dispensator," who sold the produce of Pansa's estate, as there is a door between it and one of the shops. Beyond the cubiculae are two recesses or alae (4). Opposite the entrance door was the tablinum (5), which opened also to the peristyle beyond,* with a passage (7) (fauces) leading direct from the atrium to the peristyle (9) and on the right and left (8), two rooms, the smaller one a library, the other (6) a triclinium. Beyond was the peristyle, with sixteen columns of the Ionic order. On the right and left are two other recesses or exedrae (10), and on the left three more cubiculae (11). In the centre beyond was the oecus or reception-room of the family (14)—a passage (17) leading to the garden in the extreme rear—and the winter triclinium (15) on the right. Beyond these again was a portico (18) overlooking the garden, and a small room (16) which may have been the boudoir of the lady of the house. To the left of the passage were the kitchen (culina) and offices (19, 20, and 21); a second room of larger size (13) on the right is thought to have been the principal triclinium; (S, S) were shops, the two at the corner of the block being in communication with the bakeries (B) beyond. Besides, on the left, were two rooms (*h*, *h*), each with an upper floor, and on the right, three small houses (H, H, H).

Assuming the two doors in the prothyrum or vestibule to be open, and the curtains at the rear of the tablinum and the front of the oecus drawn aside, the passer-by in the street commanded a view of the interior of the house from one end to the other. This seems to have been the leading principle on which all the houses in Pompeii were planned, and may account in some cases for the elaborate nature of some of the sculptural accessories, even in the smaller houses, such as that of which Ill. 240 is an example. Even in the case of a small house, where the peristyle terminated in a wall, the wall was painted to represent a garden beyond.

Variations from the plan just described are found in the House of the Faun,† where the peristyle is turned the other

* In the House of the Silver Wedding fastenings in bronze were discovered *in-situ* which showed that curtains attached to them could be drawn across the rear of the tablinum, and similar enclosures were probably provided for other doorways, as no doors except at the entrance of the house have been traced.

† The names given to the houses are derived from features found in them, such as works of art or inscriptions with the names of persons.

way and its axis is not the same as that of the atrium (Ill. 241). This was apparently in consequence of there being a second residence on one side (probably occupied by some member of the same family, as there are three or four doors communicating between the two). All the bedrooms of the family of the principal house were on an upper floor over the oecus and triclinium.

In the House of the Silver Wedding* the atrium was tetrastyle—that is, with four columns of the Corinthian order supporting the ceiling. The dimensions of the atrium (fifty by forty feet) made it impossible to cover it in any other way.

The House of Epidius Rufus had a Corinthian atrium with sixteen Doric columns, but no peristyle, there being only a portico overlooking the garden at the back.

In the House of the Tragic Poet, remarkable for the paintings it contained representing scenes from the *Iliad*, the peristyle was enclosed with a porticus on three sides only.

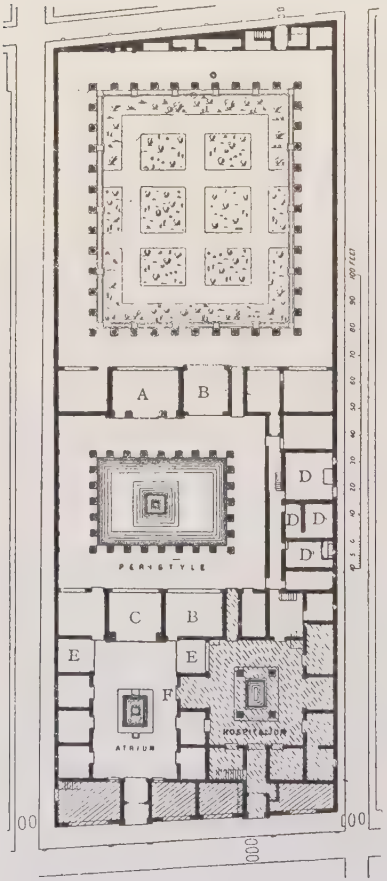
240.—FOUNTAIN IN THE HOUSE OF THE BALCONY AT POMPEII.

Different from all of these is the House of Vettius, excavated in the year 1894, and in much better preservation than any building lately discovered. Owing to want of space, the atrium adjoins the peristyle, so that the tablinum occupies the position of one of the alae, and has a wide opening towards the peristyle from which it appears to be mainly lighted. The illustration (242) shows the peristyle with its original decorative features, such as pedestals with statues or figures, marble tables, baths, hermae,† etc.

* So called because it was excavated in 1892, in the presence of the King and Queen of Italy, on the celebration of their silver wedding.

† Herms or Hermae were in great demand by the wealthy Romans for the decoration of their gardens, and they were generally crowned with the busts of

The only two other houses which might be referred to are the House of Sallust and the Villa of Diomede; the former because it apparently belongs to another class of residence, viz., an inn or hotel. On the left-hand side of the vestibule is a shop for the sale of drinks, which has a wide opening into the vestibule and a door leading to the atrium. On the right is a second room, which was open to the street, the vestibule, and the atrium, and may have been the commercial room or the landlord's office. There is no peristyle, but a porticus facing a small garden in the rear, where in the farther angle is an open-air triclinium, which still retains its marble table in the centre and three stone couches. The roof consisted of a trellis, over which probably a vine was trained, similar to many such retreats to be found in Italy in the present day. Here the rear wall was painted to represent a garden. The Villa of Diomede was situated outside the town, beyond the Herculaneum Gate. It was built on sloping ground, so that the entrance door, in the centre of the main front, is five feet above the roadway, and the ground at the rear is at a lower level. The central axis of the villa lies at an angle of forty-five degrees with the road, and the



A, Oecus. B B, Triclinia. C, Tablinum. D, Culina. E, Alae.

241.—PLAN OF THE HOUSE OF THE FAUN AT POMPEII.

philosophers and poets. They were derived from the Greek custom of raising a heap of stones or sometimes a single block as a sign-post with distances inscribed upon it, etc., to mark a boundary of land or a cross road, and were dedicated to Hermes, the god of roads and boundaries.

242. THE PERISTYLE OF THE HOUSE OF VETTIUS AT POMPEII.

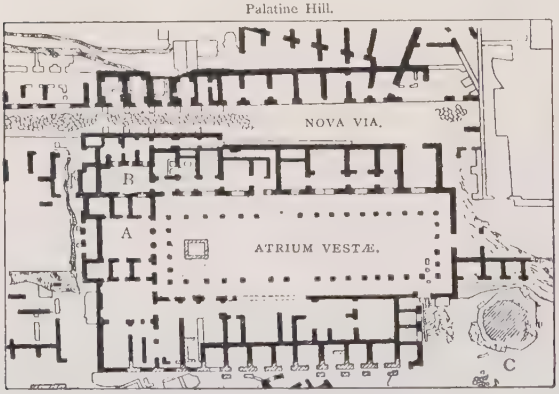
triangular plot on the left of the entrance door has been utilised for a complete set of baths. From the entrance porch (the only example projecting in front of a house) one entered direct into the peristyle. At first sight it resembles the Corinthian atrium, especially as the tablinum occupies the usual position ; but the centre court was planted with shrubs and flowers, with a fountain in the centre as in a peristyle. The rooms round also are of larger size, and one of them (probably the principal bedroom) is of elliptical shape, with three windows overlooking a garden being virtually a bow window. At the back of the tablinum a colonnade with terrace in front overlooking the garden. Under the terrace, at a lower level, was a series of rooms, of which the vaults remained intact. These were all lighted through a portico overlooking the garden, which measured eighty-five feet by seventy-three feet, with a small fish-pond in the centre, and beyond it an arbour with columns round carrying trellis-work. The portico was carried on all four sides of the garden, and consisted of square piers with moulded caps standing on a low wall. Beneath the portico on three sides were cellars in a cryptoporticus, vaulted and lighted through openings in the low wall above.

Houses in Rome.

Passing on to the two existing examples in Rome: the House of Livia was on two levels. On the lower level, reached from the cryptoporticus, was an open atrium (see plan (9), Ill. 233, p. 288), with tablinum and alae on each side, and to the right the triclinium, by the side of which was a flight of steps leading to a large number of rooms and a set of baths, all on the higher level behind the tablinum. A staircase in the court round which the bedrooms were placed led to an upper storey, of which nothing remains.

The House of the Vestals (Ill. 243) differed from any of the examples already described, in that it consisted mainly of one immense atrium (one hundred and eighty feet long by forty-eight feet wide), surrounded with a peristyle of columns in two storeys giving access to a large number of rooms on three sides. At the farther end of the peristyle was the Tablinum (A), a hall forty-one feet long by twenty-nine feet wide, and forty-one feet to the soffit of the barrel vault with which it was covered. On

each side of the Tablinum, with doorways opening into it, were three rooms assumed to have been the private rooms of the six Vestal Virgins. Baths (B), kitchen and bakeries, and stairs to the upper storey occupied the farther corner of the site. A great portion of the upper storey of the House of the Vestals still exists on the side of the Palatine Hill, and is of special interest as being the only instance in which hypocausts have been found above the ground floor. The rooms were small, but the walls were all at one time faced with marble slabs, and many of them contained baths sunk in the floor and lined with marble. With the exception of the several offices, all the rooms on the ground floor were also cased and paved with rich oriental marbles on both wall and floor, and the columns of the peristyle were monoliths of cipollino and breccia coraline.



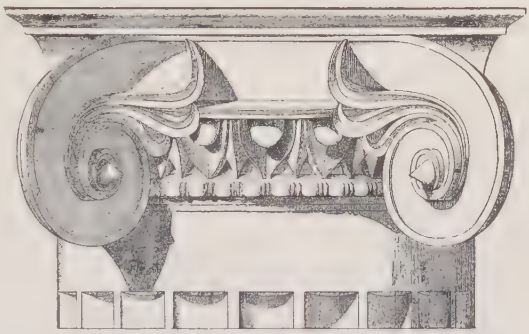
A, Tablinum; B, Bath; C, Site of Temple of Vesta.

243.—PLAN OF THE HOUSE OF THE VESTALS AT ROME.

Comparing the architectural detail of Pompeii with work in Rome of the same period, there are both Greek and Etruscan elements in the former which do not exist in the latter. This is most noticeable in the mouldings and ornament and in the character of the "orders" employed. The Doric order of Pompeii approximates very closely to Greek work in the profile of the echinus of the capital, the absence of a base, and in the flutings. The slender proportions of the columns, approaching sometimes nine diameters, arises probably from their having to support a timber superstructure only.

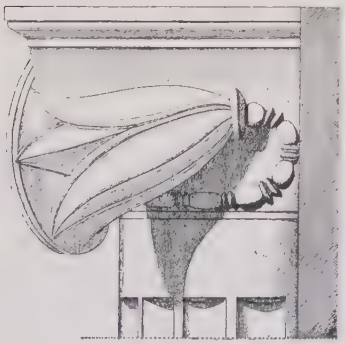
The capital of the Pompeian Ionic order in which the volutes are canted at the angles, projects much less than the Roman-Ionic capital, where the abacus averages one and a half diameters, whereas in Pompeii it is only one and a sixth. The capital (Ill. 244), found in a house in the street of the theatres, belonged to an engaged column, and its sculptor has introduced

an original treatment in the carving of the side (Ill. 245). The strong accentuation of the anthemion in the Pompeian capitals (Ill. 188, p. 230), which fills the gap between the volute and the egg and tongue moulding, is found in the Ionic capitals of the Tomb of Theron at Agrigentum, and in the frieze of the Etruscan gateway at Perugia (Ill. 124, p. 146), so that it is difficult to decide whether it has an Etruscan or Greek origin. Similar examples have been found at Olympia, but not necessarily of earlier date than these at Pompeii.



244.—IONIC CAPITAL OF A HOUSE IN THE STREET OF THE THEATRES AT POMPEII.

In the Corinthian Order, however, the Greek type is absent, there is a considerable variety of design in the capitals, but rarely is the leaf foliage of the acanthus spinosus found. The type adopted in the capitals of the Temple of Vesta at Tivoli is the most frequently followed, and the three or four examples found are absolutely of the same design. In the capitals of pilasters or square piers, where heads are introduced, the lower range of leaves has the same crinkled form as in the Temple of Vesta example.



245.—SIDE VIEW OF CAPITAL SHOWN IN ILL. 244.

We have already referred to the rich decoration of the vaults of the baths and some of the houses. There are unfortunately no vestiges of the roofs, or representations of them in the paintings on the walls (except so far as in the indication of the mutules of projecting eaves), and no descriptions to suggest how the ceiling under the roof over the atrium was treated. With the Tetrastyle and Corinthian

atrium there would be no difficulty, but in the Tuscan atrium the span was sometimes rather large, and although the Romans knew how to truss a roof, there is no reason for supposing they had sufficient knowledge to enable them to truss a beam. Probably they contented themselves with the superposition of two or more beams, binding them together with iron straps. The ceiling under the roof formed so important a feature in the Roman house that, if only to be in harmony with the painted decorations of the walls, it must have been elaborately framed and panelled or coffered, and richly decorated, painted, and gilt. The only portion of the Pompeian roof which has come down to us is its covering; and the large and varied collection of terra-cotta tiles, antefixae, gutters, pendant friezes, and other features which have been found in the excavations at Pompeii show us that great importance was attached to that feature. The sima or gutter round the compluvium, of which there are some very rich examples, was the first feature which would attract the attention of any visitor to the atrium, and above this the antefixae forming the termination of the covering tile roll would rise and break the skyline. The headpiece of this chapter (Ill. 231), is an example of a type of gutter in which the ancient Greek form of the sima seems to have been adhered to; its decoration with lion's mouth and griffins moulded on each side is full of vigour.

246.—EXAMPLE OF ANCIENT WALL IN POMPEII.

In the earliest houses found in Pompeii the walls are built in ashlar, and, beyond a coat of stucco in the interior, do not

247. AN APARTMENT IN THE HOUSE OF VETTIUS AT POMPEII.

appear to have been painted. Only one or two examples still exist, and they probably on account of their good construction. After 80 B.C. the walls were built of rubble masonry of tufa, laid in clay mortar only, with occasional bond stones, and these required therefore a stucco coating to preserve them. In the time of Augustus burnt brick was employed for quoins and bond courses, and the rubble masonry was laid in mortar. The system of building in concrete practised in Rome does not seem to have extended to Pompeii, but the outside walls were faced with opus incertum and opus reticulatum, subsequently covered with stucco and painted. Externally the colours employed were very simple, and confined to yellow, with a darker colour for the lower portion. Sometimes, as in the illustration shown (Ill. 246), there would be an architectural treatment, with pilasters and panels between, all moulded in stucco. In the main streets the fronts of the houses were occupied by shops, which were probably gaily decorated with colours. Otherwise the only architectural character given to the house was that afforded by the entrance doorway, which was flanked with pilasters and capitals in stone carrying an entablature.

The rich coloured decoration of the interior of the houses seems to have commenced about the end of the second century B.C., and at first the wall surfaces were subdivided and decorated in panels, the decoration being sometimes in imitation of marbles, probably suggested by the real material in their temples. At a later period, 80 B.C., it became the custom in the better houses to decorate the walls with pictures copied from well-known examples in Greece, and this new idea seems to have called for a distinct system in the subdivision of the walls, which henceforth consist of dado, wall, and frieze, the dado being as a rule the darkest in colour.

These pictures were executed in fresco by painting in with water-colour on the moist stucco of a freshly-prepared surface. Vitruvius gives descriptions of the methods employed in Rome, but those in Pompeii do not seem to have been so elaborately prepared. As a rule the design and composition of the figure subjects are so far superior to the execution that we may fairly assume they are replicas of well-known subjects. On the completion of the work it is thought that the colours were heightened and fixed by the application of wax under heat,

and in consequence of this they are sometimes described under the head of encaustic painting.

There are three, if not four, distinct styles of decoration in Pompeii and Herculaneum, the earliest either Etruscan or Cumaean, the second Greek, and the third Roman. To the

249.—BRONZE LAMP STANDARD FROM THE VILLA OF DIOMEDE AT POMPEII.

first probably belongs the system of dividing the surface into panels and varying the colours of same.

To the second, the introduction of reproductions of well-known Greek paintings, sometimes enclosed with architectural features, such as columns, entablatures, and friezes, all painted in recollection of existing work in Greece or elsewhere, for the designs are much finer than any architectural work in Pompeii.

248. AN APARTMENT IN THE HOUSE OF SIRICUS AT POMPEII.

In the third style the architectural accessories are of the wildest description (Ills. 247, 248, see also Ill. 205), and have led some authorities to recognise in the attenuated forms given to the columns a metallic origin. It is true that the use of iron and bronze, to which we have already drawn attention, shows that the Romans were well acquainted with these materials, and the bronze candelabra, tripods, and lampholders (Ill. 249) found in Pompeii have precisely that tenuity which is represented in the columns painted on the walls; but on the other hand, the mutules in the overhanging eaves, the panelling of the ceilings,

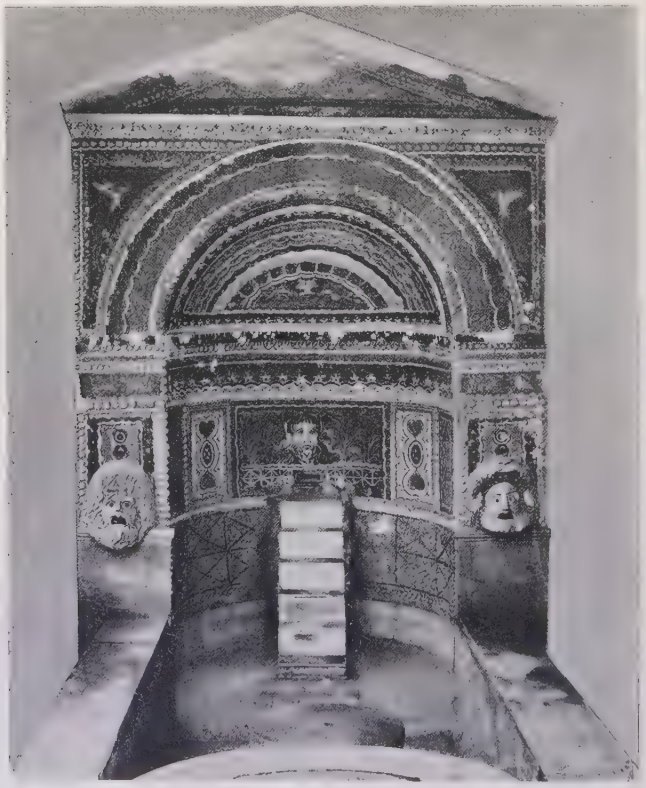
250.—THE TRIANGULAR FORUM AND REAR WALL OF THEATRE AT POMPEII.

and the arched ribs in the vault (all constructional features in wood and concrete and brick), are rarely missed in these paintings, and never found in candelabra or lampholders. Whatever may have been the origin of the wire-drawn columns, the effect of the general composition of these wall paintings is of the most charming description, and one is often surprised by the effect of distance suggested by them (Ill. 247).

There is still one other type of decoration, that which consists in the representation of natural objects, such as plants and flowers, etc.; and from the descriptions given of the marvellous dexterity of celebrated Greek artists in this class of

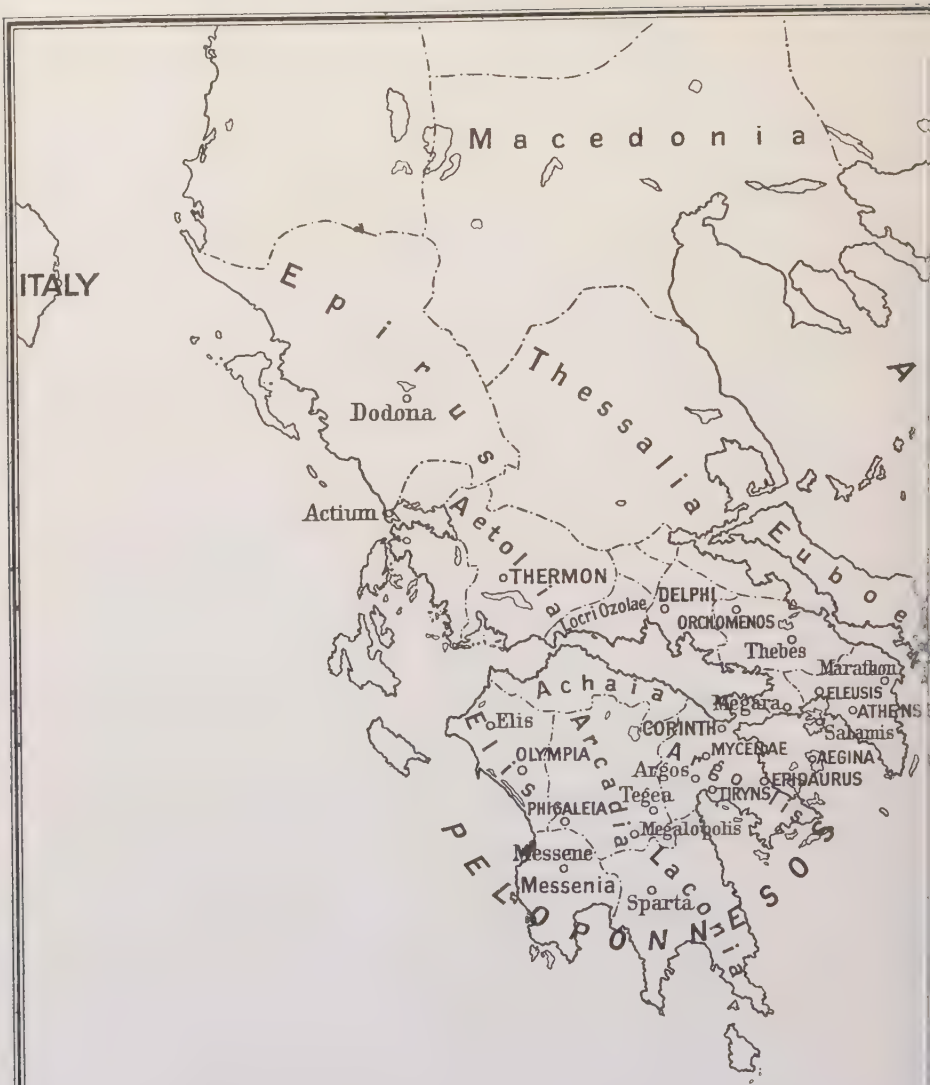
work, we may assume that the Pompeian artists followed their example, and sometimes with exceptional ability.

The examples of mural painting in Rome are not much superior to those found in Pompeii, and the subjects seem to have been of the same type. In the description given by Dr. Middleton of the paintings in the tablinum of the House of Livia, he records the fact that in one of the pictures the names of the figures represented were painted under each in Greek letters, a fact which points to Greece as the probable source from which the Pompeian paintings were derived. The grace of the single figure subjects, and the excellence in the composition of the principal frescoes, show that their artists were acquainted with and attempted to reproduce a far higher type of decorative painting than is likely to have been evolved locally in Pompeii.



251.—FOUNTAIN INCRUSTED WITH MOSAIC IN POMPEII.

MAP OF
GREECE AND
ASIA MINOR.



GREECE AND ASIA MINOR

Byzantium
Samothrace
Troy
Neandria
ASSOS
M y s i a
AIZANI
Kolumdado
Lesbos
MESSA
PERGAMUM
L y d i a
SARDIS
Phrygia
Chios
Clazomenae
Philadelphia
Teos
EPHESUS
Hierapolis
Samos
Tralles
APHRODISIAS
MAGNESIA-AD-MEANDRUM
PRIENE
EUROMUS (YAKLI)
Mylasa
Halicarnassus
Paros
Naxos
Telmissus
Pinara
Cnidus
XANTHOS
Patara
Thera
Rhodes
CNOSSUS

Aquileia
Venetia
Istria
Milan
VERONA
Pola
Illyricum
Dalmatia
Bologna
Ravenna
LUNA
RIMINI
Florence
Umbria
ANCONA
SPALATO
Etruria
CORTONA
PERUGIA
Picenum
ASSISI
Clusium
Sabini
Sutrium
Frentani
Apulia
ROME
TIVOLI
(TIBUR)
CERVETRI
Ostia
Praeneste
Latium
Samnium
Capua
BENEVENTUM
NAPLES
Pozzuoli
Campania
VULCI
Tarentum
Calabria
Pompeii
Herculaneum
PAESTUM
Lucania
METAPONTUM
Sybaris
Cotrone
Bruttii
Messina
Locri
Palermo
TAORMINA
SEGESTA
Naxos
Sicily
SELINUS
AGRIGENTUM
SYRACUSE
Gela
ITALY

CHRONOLOGICAL LIST OF GREEK TEMPLES.

Giving their approximate dates, dimensions and other details.

Date.	Name of Temple.	No. of Columns.		Upper Step of Stylobate.			Inter-columniation in terms of the lower Diameter.	No. of Diameters High.	Height of Column.	Diameter.		No. of Flutes.	Height of Architrave.	Height of Entablature.
		Front.	Flank.	Width.		Length.				Lower.	Upper.			
	DORIC.			ft.	in.	ft. in.			ft. in.	ft. in.	ft. in.		ft. in.	ft. in.
c. 1000 B.C.	The Heraeum, Olympia	6	16	58	1	129 4	2·17 average	4·68 average	17 2	3 8 average	3 2 average	20		
c. 650 B.C.	At Corinth.....	6	15	75	0	175 0	1·23	4·16	23 8	5 8	4 4	20	4 8	
580–570 B.C.	Apollo, Syracuse	6	17	72	0	172 6	1·05 front ·830 flank	4·47	26 10	6 0	5 0	16	6 3	
575 B.C.	The Olympieium, Syracuse	6	17	72	8	204 4	1·19			5 10		16		
575 B.C.	Temple C, Selinus ...	6	17	78	5	208 0	1·39	4·52	28 3	6 3	4 11	16	5 9	13 11
570–560 B.C.	Temple D, Selinus ...	6	13	76	0	183 0	1·70	4·48	24 8	5 6	3 9	20	5 2	13 5
560 B.C.	Basilica, Paestum (no guttae below triglyph)	9	18	75	3	176 9	1·40	4·42	21 0	4 9	3 2	20	3 10	
550 B.C.	Temple S (F), Selinus	6	14	79	9	204 8	1·41	5·01	29 10	6 0	4 0	20	5 0	13 0
540 & 460 B.C.	Temple T (G), Selinus columns with smaller upper diameter early period)	8	17	166	0	360 5	·98	4·77	53 4	11 2	6 3 8 0	20	9 6	22 5
530 B.C.	Ceres, Paestum (no guttae below triglyph)	6	13	47	3	105 3	1·20	4·22	17 7	4 2	2 7	20	3 3	7 10
510–500 B.C.	Hercules, Agrigentum	6	15	83	7	221 0	1·22	4·74	33 0	6 11½	4 10	20	5 2	13 0
c. 520 B.C.	Apollo, Metapontum	6	12	73	9	136 1	1·70	4·78	16 9	3 6	2 6	20	1 9	
c 500 B.C.	Aphaea, Aegina	6	12	45	0	94 0	1·62	5·30	17 3	3 3	2 5	20	2 11	6 10

CHRONOLOGICAL LIST OF GREEK TEMPLES—*continued.*

Date.	Name of Temple.	No. of Columns.		Upper Step of Stylobate.		Inter-columniation in terms of the lower Diameter.	No. of Diameters High.	Height of Column.	Diameter.		No. of Flutes.	Height of Architrave.	Height of Entablature.
		Front.	Flank.	Width.	Length.				Lower.	Upper.			
	DORIC—*contd.*			ft. in.	ft. in.			ft. in.	ft. in.	ft. in.		ft. in.	ft. in.
490 B.C.	Temple R (E), Selinus	6	15	83 0	224 2	1·12	4·60	33 4	7 3	5 10	20	5 9	
500–480 B.C.	Temple A, Selinus ...	6	14	53 2	131 3	1·35	4·62	20 5	4 5	3 6	20	3 7	9 2
480–440 B.C.	Zeus Olympius, Agrigentum	7	14	173 3	386 9	1·04	4·75	61 9	13 0	10 6	20	11 0	25 9
470 B.C.	Athena, Assos	6	13	46 3	99 6	1·90	5·19	15 7	3 0	2 3	16	2 8	6 9
472–457 B.C.	Zeus, Olympia	6	13	91 0	210 0	1·38	4·72	34 3	7 3	5 7	20	5 10	13 10
454–438 B.C.	The Parthenon, Athens	8	17	101 4	228 1	1·238	5·48	34 3	6 3	4 9	20	4 4½	10 8
450 B.C.	The Theseum, Athens	6	13	45 3	104 3	1·62	5·77	18 9	3 3	2 6½	20	2 9	6 6
450 B.C.	Themis, Rhamnus ...	2 in-antis		20 10½	32 9	1·50	5·55	14 4	2 7	1 11	20	1 11	4 9
450–440 B.C.	Hera (Juno Lacinia), Agrigentum	6	13	55 9	124 11	1·28	4·58	21 2	4 7½	3 6	20	3 9	
440 B.C.	Poseidon (Sunium) ...	6		43 9	94 11	1·47	6·00	20 2	3 4	2 7	16	2 8	6 6
440–430 B.C.	Neptune, Paestum ...	6	14	79 8	192 8	1·17	4·07	27 6	6 9	4 8	24	4 11	12 0
430–420 B.C.	At Segesta	6	14	76 6	190 9	1·18	4·79	30 9	6 5	4 0		3 9	11 8
430 B.C.	Apollo, Bassae	6	15	48 3	125 7	1·36	5·17	19 5	3 9	3 0	20	2 9	6 5
420 B.C.	Hera, Argos	6	14	59 0	123 0	1·53	5·63	24 5	4 4	3 5	20		
420–400 B.C.	Athena, Syracuse.....	6	14	74 0	185 0	1·26	4·69	28 11	6 2	5 0	20	1 9	4 2
410 B.C.	Nemesis, Rhamnus ...	6	12	32 10	70 5	1·90	5·55	13 5	2 5	1 10	20	2 9	6 5
C. 400 B.C.	Metroon, Olympia ...	6	11	34 10	67 9	1·33	5·38	15 3	2 10	2 6	20	2 0	4 11
400 B.C.	Concord, Agrigentum	6	13	55 9	129 11	1·18	4·73	22 1	4 8	3 8	20	3 8	9 3
340–330 B.C.	Castor and Pollux, Agrigentum	6	13	42 0	102 0	1·23	5·46	21 2	3 10½		20	2 8	7 0
C. 300 B.C.	Diana Propylaea, Eleusis	amphidistyle in-antis		20 10	39 9	1·50	5·75	14 10½	2 7	2 0¾	20	2 1	5 0

Date.	Name of Temple.	No. of Columns.		Upper Step of Stylobate.				Inter-columniation in terms of the lower Diameter.	No. of Diameters High.	Height of Column.	Diameter.		No. of Flutes.	Height of Architrave.	Height of Entablature.
		Front.	Sides.	Width.		Length.					Lower.	Upper.			
	DORIC—*contd.*			ft.	in.	ft.	in.			ft. in.	ft. in.	ft. in.		ft. in.	ft. in.
c. 300 B.C.	Jupiter Nemaeus (between Argos and Corinth)	6	13	67	7½	150	9	1·31	6·58	34 0	5 2½	4 3	20	3 4	8 2
210 B.C.	Aesculapius, Agrigentum	pseudo-amphi-distyle in-antis		30	0	65	0	1·33	5·19	20 4	3 11		20		
200 B.C.	Serapis, Taormina ...	ditto		34	0	55	9	1·43			4 0				
	IONIC.														
c. 560 B.C.	Archaic Temple of Diana, Ephesus	8	20	163	9	342	6	From 2·24 to 2·80			From 6′ 2″ to 4′ 11″	From 4′ 6″ to 3′ 10″	50		
532–521 B.C.	Juno, Samos (Dipteral)	10	21	166		344		1·70	9·5	61 0	6 5	4 9			
450 B.C.	Temple on the Ilissus, Athens	tetrastyle amphi-prostyle		19	7	41	7	2·09	8·33	14 8	1 9	1 6	24	1 7½	3 7¾
435 B.C.	Nike Apteros, Athens	ditto		18	2	27	7	2·70	7·52	13 2	1 9	1 4	24	1 6	3 9½
430–400 B.C.	Erechtheum, Athens—														
	East Portico	6 prostyle						2·27	9·35	21 7½	2 3¾	2 0	24	2 1	4 9
	West Front.....	4 in-antis						2·28	9·10	19 0	2 1	1 10	24	2 1	4 9
	North Portico ...	4 prostyle						2·67	8·70	24 3⅓	2 9½	2 8	24	2 7	6 8
4th C.	At Messa, Isle of Lesbos (Pseudodipteral)	8	14	72	9	131		1·84	8·82	29 5	3 4	2 8	24	2 7	8 9½
355–332 B.C.	Hellenistic Temple of Diana, Ephesus	8	20	163	9	342	6	2·33	9·41	56 6	6 0	5 0	24	5 0	13 11
c. 350 B.C.	The Smintheum, Troad (Pseudodipteral)	8	14	74		132	7½	1·52	9·97	38 8	3 10½	2 10	24	2 10	7 5
350–320 B.C.	Athena Polias, Priene	6	11	64		121	7½	1·32	10·19	43 3	4 3	3 7	24	3 3	8 3
330–306 B.C.	Artemis-Leucophryne, Magnesia (Pseudodipteral)	8	15	106		198		2·00	9·03	40 8	4 6	4 0	24	3 5	9 10

CHRONOLOGICAL LIST OF GREEK TEMPLES—*continued*.

Date.	Name of Temple.	No. of Columns.		Upper Step of Stylobate.		Inter-columniation in terms of the lower Diameter.	No. of Diameters High.	Height of Column.	Diameter.		No. of Flutes.	Height of Architrave.	Height of Entablature.
		Front.	Sides.	Width.	Length.				Lower.	Upper.			
	IONIC—*contd.*			ft. in.	ft. in.			ft. in.	ft. in.	ft. in.		ft. in.	ft. in.
300 B.C.	Bacchus, Aphrodisias (Dipteral)	8	13	66 6	112 0	1·30	8·53	30 7	3 7	3 2	24	2 6	7 11
330 B.C.	Dionysus, Teos	6	11	61 1	114 10	2·20	9·26	31 3	3 4½	2 10½	24	2 4	7 3
330–160 B.C.	Apollo Didymaeus, Branchidae (Dipteral)	10	21	166 0	363 0	1·76	9·96	63 1	6 4	5 6	24	3 5	10 10
1st C. B.C.	Zeus, Aizani	8	15	70 0	119 0	1·60	10·0	31 3	3 1½	2 10½	24	2 4½	7 2
	CORINTHIAN.												
	Zeus, Labranda	6	11	47 0	87 0	2·12	9·60	27 2	2 10	2 3½	24	2 1	5 6½
	Jupiter Olympius, Athens (Dipteral)	8	20	135 0	354 0	1·85	8·72	55 3	6 4	5 10½	24	4 1	
	At Cnidus (Prostyle, Pseudoperipteral)	4	8	26 4	48 0	2·80	9·47	19 4	2 0½	1 10	20	1 7	3 10
	TOMB.—IONIC.												
350–340 B.C.	Mausoleum, Halicarnassus (podium 65 ft. high, including 5 steps)	9	11	88 6	119 0	2·07	8·34	28 8½	3 5⅓	2 11	24	3 4	7 10

GLOSSARY.

Abacus.—The uppermost member of a capital. Plain in the Doric order, moulded in the Ionic and Corinthian orders. The sides are concave in the Corinthian capital, and curved over the canted volute of the Ionic capital.

Abutment.—The masonry, brickwork, or earth which counteracts the thrust of an arch.

Acroterium (*pl.* **Acroteria**).—The plinths at the angles or apex of a pediment provided to carry figures or ornaments. The term is also applied to the latter.

Agora.—A public square or market-place in Greek cities corresponding to the Forum in Roman cities.

Aisle (Lat., *ala*, a wing).—Term given to the side passages in a basilica, separated from one another and from the central area by columns or piers.

Ambulatory.—A covered promenade, straight or circular.

Amphiprostyle.—Term applied to a temple with portico of columns in front and rear only. *See* TEMPLES.

Ancones.—(1) Projecting bosses left on masonry blocks; (2) the vertical corbels on either side of a Roman doorway supporting the cornice over the same.

Anta (*pl.* **Antae**).—Pilaster (or corner post) of slight projection terminating the end of the lateral walls of a cella, and serving as respond to a column. In the latter case the columns are said to be in-antis.

Antefix.—The decorative termination of the covering tile-rolls of a roof.

Anthemion (Gr. *ανθος*, a flower).—Term given to the sheathing leaves of the flower of the acanthus, sometimes, but erroneously, called honeysuckle (Fr. *palmette*), employed in various ways to decorate acroteria, antefixes, friezes, and the necking of some Ionic capitals.

Apodyterium.—The dressing room of the Roman bath.

Apophyge (ἀπό, from, and φευγω, I flee). A. the inverted cavetto or concave sweep taken by the lower part of the shaft in the Ionic and Corinthian Orders in its junction with the base. B. The hollow or scotia beneath the Doric echinus, forming the junction between the capital and the shaft.

Apse.—A recess in the wall of a building, generally semi-circular and vaulted over.

Apteros.—Without wings. Applied sometimes to a prostyle or amphiprostyle temple, as, for instance, the Temple of Nike Apteros, Athens.

Arabesque.—Term given to the moulded stucco and painted decoration of the walls, vaults, and ceilings in the Thermae of Titus, and in Pompeii and Herculaneum. Sometimes employed to designate Arabian decoration.

Araeostyle.—Wide-spaced. The term given by Vitruvius to the wide intercolumniation of the Tuscan portico, carrying an architrave in timber. *See* INTERCOLUMNIATION.

Architrave.—A lintel in stone or beam of timber carried from the top of one column or pier to another. The lowest member of the entablature (*q. v.*). Applied also to the side posts or jambs and the lintel of a door or window.

Archivolt.—A moulded architrave carried round an arch.

Arena.—The central space in a Roman amphitheatre wherein the gladiators fought, or where contests with wild beasts took place.

Arris.—A sharp edge formed by two surfaces meeting at an external angle, as in the flutings of the Doric column.

Atlantes.—The Greek term for the male figures employed in architecture in place of columns. *See* TELAMONES.

Atrium.—The entrance court of a Roman house, roofed over at the sides, but open to the sky in the centre. In an atrium of large size four or more columns would be introduced to carry the roof. *See* CAVAEDIUM.

Attic.—Term applied to a story above the main cornice, sometimes decorated with bas-reliefs, or utilised for an inscription.

Attic base.—The favourite base of the Romans, consisting of an upper and lower torus and a scotia between, with fillets.

Balneae.—The Latin term for the public baths.

Basilica.—The Roman exchange and court of law. An

oblong, rectangular building with aisles round, and terminated at one or both ends with a recess or hemicycle (large apse), used as the Tribune.

Bibliotheca (Library).—A chamber provided with cases to hold manuscript rolls.

Bouleuterion.—The Greek Senate House.

Cabling.—*See* FLUTING.

Calidarium.—The hot chamber of the Roman bath.

Canalis (Channel).—Term given to the space between the fillets of an Ionic volute: in early work, convex; in the fully-developed types, concave.

Carceres.—A row of stalls or horse-boxes at one end of a circus enclosed by double doors, within which the chariots waited till the signal was given for starting, when the doors were simultaneously thrown open.

Caryatides.—Figures of maidens which take the place of columns in supporting an entablature, as in the Tribune of the Erechtheum, Athens.

Caulicolus.—The stalk of the acanthus plant as found in the Greek stele and in Roman Corinthian capitals.

Cavaedium (the Roman Atrium).—According to Vitruvius (VI. 3) there were five kinds—Tuscan, Tetrastylar, Corinthian, Displuviatum and Testudinatum. In the Tuscan, cross-beams carried the roof, in the centre of which was an opening called the compluvium; the Tetrastylar had columns at each angle of the compluvium, which carried the beams round the opening; whilst in the Corinthian there were also intermediate columns; in the Displuviatum the roof sloped down outwards on all four sides; and in the Testudinatum there was no opening in the roof.

Cavea.—The pit of a theatre, so called because originally it was excavated in the rocky side of a hill.

Cella.—The enclosed chamber or sanctuary of a Roman temple, corresponding with the naos of a Greek temple.

Chresmographion.—The term given to the chamber between the pronaos and the nave or cella of a Greek temple where the oracles were delivered.

Chryselephantine.—The term applied to a statue in which gold and ivory overlay a wooden core, the drapery and ornaments being of the former and the flesh of the latter material.

Clepsydra.—A vessel employed in ancient days to measure time by the running out of a certain quantity of water. There was one in the Tower of the Winds at Athens, and the turret on the south side is supposed to have contained the cistern which supplied the water.

Cloaca.—The name given to the sewers which drained the low marshy grounds between the hills of Rome. The *cloaca maxima* drained the Forum Romanum.

Coffer.—A sunk panel in a vault or ceiling.

Colonnade.—A range of columns. *See* PORTICO.

Columnae Caelatae.—The term given by Pliny to the sculptured columns of the Temple of Diana at Ephesus.

Columbarium.—A pigeon-house. The plural, "columbaria," is applied to designate the apertures formed in walls to hold the cinerary urns, and hence to the sepulchral chambers themselves.

Compluvium.—The uncovered portion of a Roman atrium.

Cornice.—The upper member of the entablature (*q. v.*) subdivided into bed-mould, corona, and cymatium; a term also employed for any projection on a wall, provided to throw the rain-water off from the face of the building.

Corona.—The lower portion of the projecting member of the cornice having a vertical face.

Cryptoporticus (literally a secret passage).—Term given to an underground vaulted corridor, lighted through openings in centre or side of vault.

Cubiculum.—A bed-chamber.

Cunei.—The wedge-shaped groups into which the seats of a theatre or amphitheatre are divided by radiating passages.

Cyclopean Masonry.—The term applied to the rude polygonal masonry employed by the Greeks and the Etruscans in the walls of their cities.

Cyma.—A moulding of double curvature. When the concave portion is uppermost it is called a cyma-recta; when the convex part is at the top it is called cyma-reversa.

Cymatium.—Another term given to the crowning moulding of an entablature when it takes the cyma-recta form.

Dado.—The lower portion of a wall when treated as a separate architectural feature.

Delphinae (Dolphins).—Ornaments on the spina of a Roman

circus; in allusion to Neptune, the patron deity of horses and racing.

Dentil.—Rectangular blocks in the bed-mould of a cornice, originally representing the ends of joists which carried a flat roof.

Diastyle.—*See* INTERCOLUMNIATION.

Diaulos.—The peristyle round the great court of the Palaestra described by Vitruvius (V. 11).

Diazoma.—The Greek term for the passage which separated the several ranges of seats in a theatre or amphitheatre.

Die.—The square base of a column. Applied also to the vertical face of a pedestal or podium.

Dipteral.—*See* TEMPLES.

Echinus.—The convex moulding which supports the abacus of a Doric capital. Also the circular moulding carved with egg and tongue between the volutes and sometimes carried under the cushion of the Ionic capital.

Entablature.—The superstructure carried by columns. It is divided into three parts: viz., the architrave (the supporting member, carried from column to column); the frieze (the decorative portion); and the cornice (the crowning and projecting member). It is occasionally used to complete, architecturally, the upper portion of a wall, even when there are no columns, and in the case of pilasters or detached or engaged columns is sometimes profiled round them.

Entasis (εντεινειν, to stretch a line or bend a bow).—The increment or slight convex curve given to the column, in order to correct an optical illusion, causing the shaft when it tapers as it rises and is formed with absolutely straight lines, to appear hollow or concave.

Epinaos.—The recessed porch in the rear of a Greek temple, sometimes enclosed with bronze railings to protect treasures, and called the Opisthodomus. The term is not found in any classic author, it was formed by analogy with "pronaos," by German archaeologists some fifty years ago to take the place of the Latin word "posticum," when describing Greek temples.

Epistulion (Epistyle).—The Greek term for the architrave (*q. v.*).

Eustyle.—*See* INTERCOLUMNIATION.

Exedra.—A semi-circular stone or marble seat, or a rectangular or semi-circular recess.

Fascia.—The term given to the planes into which the architrave of the Ionic and Corinthian Orders is subdivided.

Fauces.—Side passages between the atrium and peristyle in a Roman house, or from the peristyle to the xystus or garden.

Flutes.—The vertical channels (segmental, elliptical, or semi-circular in horizontal section) employed in the shafts of columns in the classic styles. The flutes are separated one from the other by an arris in the Greek Doric Order, and by a fillet in the Ionic, and Corinthian Orders. In early and late Doric columns the flute was usually segmental, but at the best period, in order to emphasize the arris, it was formed of three arcs constituting what is known as a false ellipse; a similar curve was given to the flutes in Greek Doric, Ionic, and Corinthian columns and in early Roman examples; in later work the flute was semi-circular. In the Roman Ionic and Corinthian Orders, the lower portion of the flute up to about one-third of the height of the column was sometimes filled in with a convex moulding, to which the term cabling is applied. In one or two late Roman examples the flutes were carried spirally round the columns as in the Portico of the Agora at Aphrodisias in Asia Minor. Similar spiral fluting is found on the sides of Roman sarcophagi.

Frieze.—The middle member of the entablature. Applied also to any horizontal band enriched with sculpture. *See* ZOPHOROS.

Frigidarium.—The room or court in the Roman baths containing the cold water bath.

Groin.—The arris formed by the intersection of two vaults.

Guilloche.—A continuous flat band or convex moulding carved with interwoven fillets, leaving circular centres, sometimes filled with rosettes.

Guttae (drops).—Small pendant conical cylinders under the triglyphs and mutules of a Doric entablature. *See* TRUNNEL.

Gymnasium.—A school for the physical education and training of adults.

Helix.—The spiral tendril which is carried up to support the abacus of a Corinthian capital. There are four helices on each face.

Hemicycle.—Term given to semi-circular recesses of great size, sometimes vaulted.

Hieron.—The name given to the sacred enclosure of some Greek temples, as at Epidaurus.

Hippodrome.—The course provided by the Greeks for horse and chariot racing.

Hypaethral.—Term given to a temple the naos of which was wholly or partly open to the sky.

Hypocaust.—A space contrived under the floor of a hall or room connected with furnaces, by means of which they were warmed. Employed in Rome to heat the calidarium and other halls of the Thermae and Balneae, and, in colder climates, the principal rooms of a house.

Hypotrachelium (Gk., under the neck).—One or more grooves under the necking or gorge of the Greek Doric capital which mask the junction of capital and shaft.

Impluvium.—A shallow tank in the atrium of a Roman house, provided to receive the rain falling through the compluvium.

Intercolumniation.—The distance between the columns of a peristyle, always defined in terms of the lower diameter of the columns. They are thus set forth by Vitruvius (III. 3)—Pycnostyle, where the columns are $1\frac{1}{2}$ diameters apart; Systyle, 2 diameters; Eustyle, $2\frac{1}{4}$ diameters; Diastyle, 3 diameters; and Araeostyle, $3\frac{1}{2}$ diameters; the latter carrying architraves in wood only.

Labrum.—A stone bath, circular or oblong. The large vessel of the warm bath, sometimes of marble, granite, or porphyry.

Laconicum.—The sweating room of a Roman bath.

Lararium.—The room in which the Lares, or household gods, were placed. Sometimes represented by a niche only.

Megaron.—The principal or men's hall in the Mycenaean palace.

Meta.—The goal or turning-point for the chariots in a Roman circus.

Metope.—Originally the open space between the beam-ends of the Doric ceiling, and applied afterwards to the slabs filling up these openings.

Modillion.—The horizontal corbels carrying the corona of a Roman cornice.

Module.—Usually the half diameter of the lower part of the shaft of a column.

Mutule.—A projecting slab on the soffit of the Doric cornice.

Nymphaeum.—A chamber (sometimes subterranean) in which were plants and flowers and a fountain or running water.

Naos.—The term given to the cella of the Greek temple.

Odeon.—A circular building in which rehearsals and musical contests took place in Greece.

Oecus.—In Greek houses (according to Vitruvius, VI. 10) the room in which the mistress of the house sits with the spinsters. It was used also as a banqueting room. There were four kinds of oeci, viz., the Tetrastyle, the Corinthian, the Egyptian, and the Cyzicene.

Opaion.—The Greek word for the lacunaria or ceiling panels of a peristyle. Applied also to an hypaethral opening in a roof.

Opisthodomus.—The treasury of a Greek temple (the term is sometimes given to the epinaos when used for a similar purpose).

Orthostatae.—The bottom course of the walls of the naos of a Greek temple, generally twice or three times the height of the upper courses.

Ova.—Seven marble eggs placed at each end on the spina, one being removed after each lap of the race.

Palaestra.—A training school for boys in physical exercises.

Parascenium.—The side walls of the stage.

Peripteral.—Term applied to a building surrounded by a row of columns. *See* TEMPLES.

Peristyle.—Term given (A) to a covered colonnade which surrounds a building or court. (B) The inner court of a Pompeian house.

Pinacotheca.—A picture gallery.

Podium.—The Greek term for a low wall or continuous pedestal on which columns are carried. It consisted invariably of a cornice, a dado and a plinth, and the Etruscan and usually the Roman temples were raised on it. The term was also applied to the enclosure wall of the arena of an amphitheatre.

Portico.—A porch or entrance to a building. The term, when applied to a Greek or Roman temple, is classed as (Distyle-in-antis), two columns between antae; (Tetrastyle Prostyle),

four columns in front; (Hexastyle), six columns; (Heptastyle), seven columns; (Octostyle), eight columns; (Enneastyle), nine columns; (Decastyle), ten columns; and (Dodecastyle), twelve columns. *See* TEMPLES.

Porticus.—A building with its roof supported by one or more rows of columns, either in one straight line or enclosing a court. The same as the Greek stoa.

Posticum.—The Latin term for the recessed porch in the rear of a Roman temple.

Pronaos.—The porch in front of the naos.

Propylaeum.—The entrance gate to the Temenos or sacred enclosure of a temple, when there is one doorway only; when there is more than one doorway, as at Athens and Eleusis, the term *propylaea* is given.

Proscenium.—The stage in ancient theatres—a term sometimes given to the scaena (*q. v.*).

Prostyle.—Term applied to a temple with portico of columns in the front.

Prothyrum.—The vestibule or entrance passage to the atrium of a Roman house.

Prytaneum.—The state dining-room or guest-house in a Greek city.

Pseudodipteral.—Term applied to a dipteral temple with the inner row of columns omitted. *See* TEMPLES.

Pseudoperipteral.—Term applied to a peripteral temple where some of the columns are engaged in the wall of the cella. *See* TEMPLE.

Pteroma.—The passage between the walls of the cella and the peristyle.

Pteron (Gr. **Wing**).—The wing or lateral colonnade of a temple, and by Pliny referred to, as the feature carrying the superstructure of the tomb of Mausolus.

Pycnostyle.—*See* INTERCOLUMNIATION.

Pulvinar.—A cushion. Applied sometimes to the hemicycle or enclosed space on the stadium where the Emperor sat on cushions. *See* (I.), Ill. 233.

Quadriga.—The ancient four-horsed chariot.

Regula.—A narrow strip under the taenia of a Doric architrave, beneath which the guttae are carved.

Respond.—(1) The wall pilaster behind a column. (2) The wall pier carrying either the end of an architrave or beam or the springing of an arch.

Scaena.—The back wall of the stage; a term sometimes given to the retiring room behind the stage, hence the word proscenium.

Sima.—The term sometimes given to the marble or stone gutter of Archaic temples to distinguish it from the cyma or cymatium of later examples. The sima of the Archaic Temple of Diana was 2 feet 10 inches high; it leant slightly forward in one plane, was decorated with figures in low relief, and was provided with outlets for rain-water at intervals in the form of lion's heads. The cymatium, on the other hand, was ogee in section.

Spina.—The podium wall down the centre of the Roman circus, on which the delphinae, ova, statues, obelisks, etc., were raised.

Stadia.—A racecourse of fixed dimension, viz., six hundred Greek feet.

Stadium (Gr. Stadion).—A racecourse.

Stele.—Term given to (1) an upright Greek tombstone; (2) to the central acroterium of a Greek temple; (3) to any upright stone.

Stereobate.—The substructure of a temple.

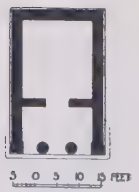
Stoa.—In Greek architecture a term corresponding with the Latin porticus (*q. v.*).

Stylobate.—The upper step of a peripteral temple which formed a platform for the columns. The term is often applied to the three steps.

Sudatorium.—The sweating room of a Roman bath. Same as laconicum.

Systyle.—*See* INTERCOLUMNIATION.

Taenia.—The projecting fillet which crowns the architrave of the Doric entablature.



252.—TEMPLE OF THEMIS, RHAMNUS.

Telamones.—The Roman term for male figures forming supports. *See* ATLANTES.

Temenos.—The sacred enclosure in which a Greek temple stands.

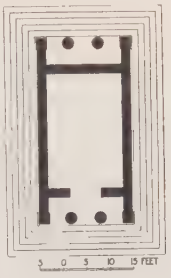
Temples.—*Types of Plan:*

Distyle-in-antis—Temple of Themis at Rhamnus (Doric, Ill. 252).

Amphidistyle-in-antis—Temple of Diana Propylaea at Eleusis (Doric, Ill. 253).

Tetrastyle prostyle—Temple B. at Selinus (Doric, Ill. 35).

Tetrastyle amphiprostyle—Temples of the Ilissus (Ill. 66) and of Nike Apteros at Athens (Ionic).



253.—TEMPLE OF DIANA PROPYLAEA, ELEUSIS.

Hexastyle peripteral—Heraeum at Olympia (Ill. 18). Temples at Corinth (Ill. 20), Syracuse (Ill. 22, 23, 25), Selinus (Ill. 35), Girgenti and Paestum (Ill. 27, 28), the Theseum at Athens (Ill. 67), and Temples of Zeus at Olympia (Ill. 84), Aphaea at Aegina (Ill. 42, Doric), and of Minerva Polias at Priene (Ill. 101), and Dionysus at Teos (Ionic).

Octostyle peripteral—The Parthenon, Athens (Doric, Ill. 52), and Temples of Apollo (Smintheus), Troad (Ill. 100), Artemis at Magnesia, Dionysus at Aphrodisias (Ionic), and Zeus at Labranda (Corinthian), all in Asia Minor.

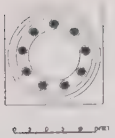
Octostyle dipteral—Temples of Diana at Ephesus (Ionic, Ill. 95), and of Zeus Olympius at Athens (Corinthian, Ill. 110).

Octostyle pseudodipteral—Temple T. at Selinus (Doric, Ill. 35), Temple at Messa, Isle of Lesbos (Ionic, Ill. 82).

Decastyle dipteral—Temple of Apollo Didymaeus (Ionic, Ill. 96).

Circular Temples:

Monopteral—Temple of Roma and Augustus at Athens (Ill. 254).



254.—TEMPLE OF ROMA AND AUGUSTUS, ATHENS.

Peripteral—Tholos at Epidauros (Ill. 87); Philipeum at Olympia; Temple of Vesta at Rome (Ill. 178).

Exceptional Plans:

Distyle pseudo-amphi.—Temples of Aesculapius, at Girgenti (Ill. 41), and of Serapis, at Taormina (Doric).

Prostyle pseudoperipteral—Temple at Cnidus (Corinthian), Fortuna Virilis at Rome (Ionic, Ill. 132).

Hexastyle pseudoperipteral—Maison Carrée at Nismes (Corinthian, Ill. 171).

Heptastyle pseudoperipteral—Temple of Jupiter at Girgenti (Doric, Ill. 37).

Enneastyle peripteral—The so-called Basilica at Paestum (Ill. 26).

Tholos.—Term given to a Greek circular building with or without a peristyle.

Trachelium (Gk.).—The necking or gorge of the Greek Doric capital between the annulets on the echinus and the grooves which mask the junction of capital and shaft.

Triclinium.—The dining-room of a Greek or Roman house, so called from κλινη, a couch, as it contained three couches upon which the ancients reclined at meals.

Triglyph.—A projecting band dividing the metopes, emphasised with vertical channels and chamfers.

Trunnel.—A pin or peg. Carved in stone beneath the regula of the architrave and the mutule of the cornice. *See* GUTTAE.

Tympanum.—Term given to the triangular recess enclosed by the cornice of the pediment and the entablature.

Velarium.—An awning of great size stretched above an amphitheatre to protect the spectators from the sun and rain, used sometimes also in the atrium of a Roman house.

Villa.—In Roman architecture the term given to a country mansion or palace.

Volute.—The spiral scroll of the Ionic capital.

Voussoir.—A wedge-shaped stone which forms one of the units of an arch.

Xoanon.—A rude and primitive image, generally of a deity, carved in wood.

Xystus.—A Roman garden planted with groves of plane trees, and laid out with flower-beds. In Greece the xystus was a covered promenade.

Zophoros or **Zoophoros.**—Term given to a continuous frieze sculptured in relief with the forms of human beings and animals.

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